" A STUDY OF LIQUIDITY, PRODUCTIVITY VIZ. – A- VIZ. FINANCIAL EFFICIENCY OF BIRLA GROUP OF COMPANIES"

A THESIS

SUBMITTED TO THE
SAURASHTRA UNIVERSITY
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
(FACULTY OF COMMERCE)

SUBMITTED BY
BUTALAL C. AJMERA
LECTURER IN ACCOUNTANCY
LATE SHREE D.M. BARAD ARTS & COMMERCE COLLEGE, GHUSIYA (GIR), TAL: TALALA (GIR) DIST: JUNAGADH.

UNDER THE SUPERVISION OF
Dr. SANJAY J. BHAYANI
ASSOCIATE PROFESSOR
DEPARTMENT OF BUSINESS MANAGEMENT
(M. B. A. PROGRAMME)
SAURASHTRA UNIVERSITY
RAJKOT – 360 005

DECEMBER – 2005

CERTIFICATE

This is to certify that synopsis titled "**A STUDY OF LIQUIDIY, PRODUCTIVITY VIZ. -A- VIZ. FINANCIAL EFFICIENCY OF BIRLA GROUP OF COMPANIES**" submitted by Mr. Butalal C. Ajmera for the award of Degree of doctor of philosophy in the faculty of commerce is based on research work carried out by him under my guidance and supervision. To the best of my knowledge and belief it has not been submitted for any other degree or diploma.

Dt.: Dec., 2005

(Dr. Sanjay J. Bhayani)
Associate professor,
Deptt. of Business Management
Saurashtra University,
Rajkot – 360 005.

BUTALAL C. AJMERA, (M.Com. M. Phil.)
Lecturer in Accountancy
Late Shree D.M. Barad Arts & Commerce College,
Ghusiya (Gir), Tal: Talala (Gir),
Dist: Junagadh.

DECLARATION

I hereby declare that for the thesis, which I am going to submit, no degree or diploma or distinction has been conferred on me before, either by this university or by any other university.

Date : December, 2005 **(BUTALAL C. AJMERA)**

Place: Rajkot

CONTENTS

CHAPTER – 1
CONCEPTUAL FRAMEWORK OF LIQUIDITY, PRODUCTIVITY, PROFITABILITY AND EFFICIENCY ANALYSIS

- **Concept of Financial Analysis**
- **Concept of Liquidity**
- **Concept of Productivity**
- **Concept and Measurement of Profitability**
- **Concept of Activity Analysis**
- **Concept of Financial Structure Analysis**
- **Significance of the Study**
- **Evaluation Methods**
- **Reference**

CHAPTER – 2
PROFILE OF BIRLA GROUP OF COMPANIES
A BIRD' S EYE VIEW

- **Profile of the Industrialisation**
- **Brief History of Birla Groups**
  - **Business expansion**
  - **Contribution to the national economy**
  - **Social contribution**
  - **Overseas operation**
  - **New family set up**
  - **Prospects of Birla group of India**
  - **Brief Introduction to the selected units**

- **Conclusions**
- **References**

CHAPTER – 3
RESEARCH METHODOLOGY

- **Problem Identification**
- **Survey of Existing Literature**
- **Title of the Problem**
- **Objectives of the Study**
- **Hypothesis**
- **Scope of the Study**
- **Period of the study**
- **Data Collection and Data Analysis**
- **(I) Tools of Analysis:**
    1. **Concept of variables**
    2. **Ratio analysis**
    3. **Trend analysis**
    4. **Comparative Statements analysis**
        i. **Comparative Balance sheet**
        ii. **Comparative Income statements**

(II) Statistical Tools

1. **Chi-Square test**
2. **Kruskal Wallis Test**
3. **Index Numbers**
4. **Arithmetic mean**
5. **Standard Deviation**
6. **Co-efficient of Variation**

- **Outline of chapter plan**
- **Limitation of Study**
- **Reference**

CHAPTER – 4
ANALYSIS OF LIQUIDITY

- **Concept of Liquidity**
- **Concept of Working Capital**
- **Importance of Working capital**
- **Analysis of Liquidity Position Through Working Capital Ratio:**
  1. **Current Ratio**
  2. **Quick Ratio**
  3. **Inventory to Working Capital Ratio**
  4. **Working Capital Turnover**
  5. **Debtors Turnover**
  6. **Average Collection Period**
- **Conclusions**
- **References**

CHAPTER – 5
PRODUCTIVITY ANALYSIS

- **Concept of Productivity**
- **Productivity and Production**
- **Productivity and Profitability**
- **Partial productivity and overall productivity**
- **Productivity Accounting:**
    1. **Material Productivity**
    2. **Labour Productivity**
    3. **Overhead Productivity**
    4. **Overall Productivity**
- **Conclusions**
- **References**

CHAPTER – 6
ANALYSIS OF FINANCIAL EFFICIENCY

- Ø **Concept of Financial Efficiency**
- Ø **Concept of Profitability**
- Ø **Profit and Profitability**
- Ø **Measurement Tools of Profitability**
  - **(I) Profitability Ratio in Relation to Sales**
    1. **Gross Profit Ratio**
    2. **Operating Ratio**
    3. **Net Profit Ratio**:
  - **(II) Profitability In Relation to Capital Employed:**
    1. **Earning Per Equity Share**
    2. **Return on Capital Employed**
       - **(i) Return on Gross Capital Employed**
       - **(ii) Return on Net Capital Employed**
    3. **Return on Owners Equity**
- Ø **Conclusions**
- Ø **References**

CHAPTER – 7
ANALYSIS OF ACTIVITY

- Ø **Concept of Activity**
- Ø **Activity Ratio**
  1. **Total Assets Turnover Ratio**
  2. **Fixed Assets Turnover Ratio**
  3. **Current Assets Turnover Ratio**
  4. **Capital Turnover Ratio**
- Ø **Conclusions**
- Ø **References**

CHAPTER – 8
ANALYSIS OF FINANCIAL STRUCTURE

- **Concept of Financial Structure**
- **Assets Structure and Capital Structure**
- **Financial Structure Analysis through the Ratio**
    1. **Debt Equity Ratio:**
        - **(i) Long-Term Debt Equity Ratio**
        - **(ii) Total Debt Equity Ratio**
    2. **Interest Coverage Ratio**
    3. **Fixed Assets To Capital Employed.**
    4. **Capital Gearing Ratio**
    5. **Proprietary Ratio**
    6. **Net Fixed Assets To Net-Worth Ratio**
- **Conclusions**
- **References**

CHAPTER – 9

SUMMARY, CONCLUSION AND SUGGESTIONS

PREFACE

The present study deals with the Study of Liquidy, Productivity viz a viz. Financial Efficiency of Birla Group of Companies, which are mainly engaged in production of Cement, Textiles, Automobile, Alluminium Products, Engineering, Tea, Agro Products and Paper etc. This study is aimed at exploring the liquidity, productivity viz a viz-financial efficiency of Birla Group of Companies. The Birla Group of Companies played an important and Multi-dimensional role of uplifting and taking our country out of lamentable state of industries we experienced soon after independence. Our overall progress and around prosperity owe a great deal to the multifaced role performed by some of very important Birla companies. The aim is to know how the Birla Group' s have utilized their resources and to study liquidity, productivity, financial efficiency, and to make the analysis of activity and financial structure and their contribution to the upliftment and betterment of the society.

The Birla Group of Companies in India which are mainly engaged in the production of Cement, Textiles, Automobile, Alluminuim Products, Tea, Agro Products, Paper Products and Engineering works are taken up for the study. For the purpose of ascertaining liquidity, productivity viz a viz financial efficiency of Birla Group of Companies, sixteen (16) leading companies of Birla Group' s having a large plant have been selected. The period covered under the study extends over six years from 1997-98 to

2002-03. Adopting various techniques such as ratio analysis trend analysis has made analysis of selected units.

In order to judge the efficiency and performance of the Birla Group of Companies which the help of published accounting annual reports, some publications and autobiography related with Birla family was also studied. Most useful information has been gathered from the various journals reports, periodicals and daily newspapers. It is hoped that the thesis will be of immense help and use to practicing financial Managers, Management, Government officials, employees, Shareholders, Academicians and research scholars.

The present study is divided into nine chapters. The first chapter is the Conceptual Framework of Liquidity, Productivity, Profitability, and Financial Efficiency. The second chapter focuses on Profile of Industrialization and Birla Group of Companies. The third chapter is related with the Research Methodology. In the fourth chapter the Liquidity Position of the Birla Group of Companies has been analysed. The productivity of the Birla Group of Companies has been critically analysed in the fifth chapter. The sixth chapter has been devoted for the Analysis of Financial Efficiency. The seventh chapter deals with the Activity Analysis of selected Birla Group of Companies. The eighth chapter deals with Financial Structure Analysis of the Birla Group of Companies. Finally, in the last chapter suitable and significance suggestions have been made and conclusion drawn.

I owe a deep gratitude to Dr. Sanjaybhai J. Bahyani, Associate Professor, Department of Business Management, Saurashtra University, Rajkot who has guided me through out my research work.

I am thankful to Dr. Pratapsinh L. Chauhan Professor & Head, Department of Business Management, Saurashtra University, Rajkot for inspiring and providing valuable guidance in my research work.

I am also obliged to Dr. Daxaben Gohil, Associate Professors, Department of Commerce, Saurashtra University, Rajkot for giving me valuable suggestions and moral boosting.

For completing the present study, I got assistance, valuable advice and suggestions, directly or indirectly from many of my teacher, well-wishers, colleagues, officials and a special indebts of gratitude is due to my parents, who took keen interest through the work and inspired me.

Finally, I acknowledge that this work would never been possible without the consistent support and encouragement of my life partner "JIGNASHA" and beloved son "MAHARSHI".

Date: December, 2005 (*BUTALAL C. AJMERA)*

Place: Rajkot

List of Tables

LIST OF GRAPHS

LIST OF DIAGRAMS

LIST OF ABBREVIATIONS

AVE.	AVERAGE
BC	BIRLA CORPORATION LTD.
B.V.X.L	BIRLA V.X.L LIMITED
BPS	BIRLA POWER & SOLUTION LTD.
CEN	CENTURY TEXTILES LTD.
CMA	CEMENT MANUFACTURES ASSOCIATION
DIG	DIGVIJAY CEMENT LTD.
EPS	EARNING PER SHARE
EBIT	EARNING BEFORE INTEREST AND TAX
EBT	EARNING BEFORE TAX
GRM	GRASIM INDUSTRIES LTD.
HML	HINDUSTAN MOTOR LTD.
HIND	HINDALCO INDUSTRIES LTD.
J.TEA	JAYSHRE TEA &INDUSTIRES LTD.
KES	KESORAM INDUSTRIES LTD.
MYS	MYSORE CEMENT INDUSTRIES LTD.
OPR	ORIENT PAPER LTD.
RNK	RANK
RYN	INDIAN RAYON & INDUSTRIES LTD.
VAL	VALUE
TEX	TEXMACO INDUSTRIES LTD.
ZRY	ZUARI INDUSTRIES LTD.

CHAPTER – 1
CONCEPTUAL FRAMEWORK OF LIQUIDITY, PRODUCTIVITY, PROFITABILITY AND EFFICIENCY ANALYSIS

CONCEPT OF FINANCIAL ANALYSIS:

Financial analysis of analysis financial statements, viz balance sheet and profit and loss account aimed at diagnosing the liquidity, profitability, productivity, activity and financial condition of a business concern. Satisfactory diagnosis can rarely be made on the basis of such information which are included in these financial statements alone because figure are dumb, But, if they are analysed, they get a tongue and therefore they help the management and other interested parties in assessing the financial adventure of an enterprise.

Information contained in balance sheet and profit and loss accounting is often in the form of raw material data rather than as information useful for decision-making. The process of converting the raw data contained in the financial statements in to meaningful information for decision making is known as financial statement analysis

Profit and loss account is a dynamic statement, which shows income and expenses between two balance sheet dates. Likewise balance sheet is a ‘ static’ statement that shows the financial position on a certain date. It is an instantaneous photograph of the assets and liabilities of an enterprise at particular units of time. It is somewhat similar to the view one gets when a motion picture projector is stopped and a single frame appears of the screen.

Financial analysis is process of synthesis and intellectual activity. It is a technique of X-raying the financial position as well as the progress of a comapany. An analysis both these statements give a comprehensive understanding of business operations and their impact on the financial health. If the business operations result in profits, the total investment is enhanced,

bringing prosperity to shareholders, increase in goodwill and strengthening on credit. On the other hand, if these are looses, capital invested to the extent of loss is lost or dissipated ability to pay creditors and lenders is weakened and the business concern operates under a ‘handicap’ Financial statements are analyzed through liquidity, for that the concept of liquidity is expresses below.

CONCEPT OF LIQUIDITY

The concept of liquidity within a business is important to understand the financial management, as it is the basic criteria to test the sort term liquidity position of the enterprise. Liquidity may be defined as the ability to realize value in money the real liquid asset. It has two dimensions [A] the time required to convert the assets money and [B] The certainty of the realizable price.

Generally the term ‘liquidity’ means conversion of assets in to ‘cash’ during the normal course of business and to have regular uninterrupted flow of cash to meet outside current Liability (generally maturing within a year) as and when due and payable and also the ensure money for day to day business operations. Hence the flow of current assets should circulate with such a rapid speed that they are converted into cash within a year so that timely payment may be made to outsiders for interest, dividends, etc. If a major part of current assets is blocked in inventories and credit cells (Sunday debtors), not only ready cash will not be available to pay current debt but there is a risk shrinkage in the total current assets available because of possible fall in the value of inventories or possible losses an account of bad debts. The quality of current assets is therefore very important for analyzing liquidity.

Significance of the Liquidity Analysis:

The importance of adequate liquidity in the sense of the ability of a firm to meet current/short-term obligations when they become due for payment cash hardly is over-tressed. In fact liquidity is a pre-requisite for the very survival of a firm. The short-term creditors of the firm are interested in the sort-term solvency or liquidity of a firm. But liquidity implies, from the

viewpoint of utilization of funds of the firm that funds are idle or they earn very little. A proper balance between the two contemporary requiremnetsi.e.liquidity and probability is required for efficient financial management. The liquidity ratio measures the ability of a firm to meet its short-term obligation and reflects the short-term financial strength/solvency of a firm.

CONCEPT OF PRODUCTIVITY

"Productivity is the basic mission of any organization to provide the maximum welfare for the maximum number. Productivity as measure of efficiency and effectiveness and as a means of improving the quality of the life is generic from achieving the highest outputs from the limited resources. Producitivity implies the certainty of being able to do better than yesterday and keeping the tempo continuously to improve upon. Such continuous improvements are to be generated through the research for new twchniques, methods, process, materials, software, and expertise coupled with vision and dedicated leader-ship having the ultimate faith in the welfare of human system.[1]

Productivity is simply the ratio of output to input. When this ratio is calculated in the base year it indicates the changes in productivity efficiency over the base year. As the input consist of a number of production factors and elements. Productivity can be determined separately for each of these factors. Both the output and the input may be expressed in terms of physical units or in terms of money.

Productivity is usually defined as "a ratio of output produced per unit of resources consumed by the process. "Productivity is a measure of performance in producing and distributing goods and service: Value added, or sales minus purchase divided by workers employed"[2]

CONCEPT AND MEASUREMENT OF PROFITABILITY

Profit is the main goals for establishing business concern. Profit is the primary motivating force for economic activity. Profit has to be earned and

they have got to be earned on a regular basis. Business concerns that are unable to generate efficient profit from their operation cannot remunerate the providers of their capital and this makes it difficult for them to maintain the continuity of their existence. Profits are needed not only to remunerate capital but also to finance growth and expansion. Simply maintaining the status quo cannot always

Insure the survival of a firm in a growing economy. If the firm is to survive in competitive and expanding environment, it has to go on expanding the scale of its operations on a regular and continuing basis. "Profits are the record card of the past, the inventive lode star for the future. If an enterprise fails to make profit, capital invested is eroded and in this situation prolongs the enterprise ultimately ceases to exist."[3] Thus profit is the soul of the business concern without which it becomes weak and lifeless. "The gain resulting from the employment of capital, the excess of returns over expenditure, pecuniary gain in any transactions or occupation"

Profit can rise when the price paid by the customers for the product of the business firm exceeds the cost that has been incurred fro it. Accountants, economicts, and others have defined profit in a number of ways as per its use and purpose. There have been many theoretical discussion of the concept of profit, but there is no consensus on the precise definition of this theoretical construct.[4] There are main two concepts one is accounting concept and other is economics concept.

Accounting profit "The excess of revenue over related costs applicable to a transaction, a group of transaction of an operating profit is profit"[5] In accounting profit is generally known as the excess of total revenue over total costs associated with these revenues for the period. As such the residue of income after meeting all the "explicit", items of expenditure is termed as profit"[6] Explicit items of expenditure generally, includes, raw material consumed, direct expenses, salaries, & wages, administrative expenses, selling and distribution expenses, depreciation and

interest on capital of business firm. "The different between the sales and the costs of producing and selling that product is its profit."[7]

Economic profit

Back in 1939 the famous economist J.R.Hicks defined a man' s income as "the maximum value, which he can consume during a weak, and still expect to be as well of at end of the weak as he was at the beginning" Economics profit is the residual of income meeting all the ' explit' and ' implicit' items of expenditure for a given period. The term explit item of expenditure has the same meaning that have discussed in "accounting profit" but the implicit item of expenditure includes the amount of those factors of production, which are owned by owner. For examples the rent of own land and building, the interest of own capital and salary of owner are termed as "implicit costs" or "opportunity costs". However, the term economic profit in the form of equation can be represented as under:

Economic profit = accounting profit- implicit costs

OR

Economic profit=total revenue- (Explicit costs +implicit costs)

In economic the accounting profit known as gross profit while the profit remaining after subtracting the implicit cost of owner' s times and capital invested is known as "pure profit'

Business Profit or Income:

Businessmen and accountants usually look upon the entire return to stakeholders' profit or income, and do not regard any part of return as a cost. Thus business profit plus the normal return on investment, which is also the different between end-of – period wealth and initial investment.

Social Profit:

The business units are using care resources of the society. So they should be accountable towards the society, which provided the resources. Therefore social responsibility of the enterprise has been stressed. An increasing awareness of the social responsibilities on the part of business units

has led to the discussion of "social profit", Eichror and clerk abt. associates of U.S has suggested "social statement approach for social accounting in which the term ' social profit' or surplus has been defined. Unearths approach the excess of social benefits over social cost is termed as "social profit" or social surplus. The social benefits made available to the society by the business unit include the employment generation, payment for goods and other services, taxes paid contributions, dividends and interest paid, additional direct employee benefits like creating good township, offering good condition of work environmental improvements. Any cost, sacrifice that proves a detriment to society, whether economic or non –economic, internal or external is termed as social costs. Social costs include goods and materials acquired, buildings and equipment purchased, labor and services used, work related to injuries and illness, public services and pollution, water pollution noise pollution solid waste visual and aesthetic pollution. However there is no clear concept for measuring social benefits and social costs.

Accounting Profit and Economic Profit:

The concept of accounting profit and economic profit differ from each other from the view point of opportunity cost of capital invested and cost of owner' s time .for calculation of economic profit, opportunity cost capital and owner' s time is considered while calculating accounting profit it is ignored by accountants. In accounting "the profit is deemed to be the joint result of various factors of production while in economics, it is termed as the rent liability, wages of owner and the reward of risk bearing.

Value Added Concept:

The concept of value added is a concept broader than the concept of accounting profit and economic profit; it is a basic and broad measure of judging the performance of an enterprise. It is infect a measure of the utility that a business enterprise adds to the bought in materials and services. No business enterprise can survive or grow, if it fails to generate wealth. The business firm may exist without making profit but cannot survive without

adding value. Thus shows the greater importance of value added devices which led a large number of western countries and many Indian companies to present value Added Statements (VAS) in their annual reports.

Value added is an excess of turnover plus income from service over the cost of bought in material and services. The term ' turnover' means the total amount of sales of goods plus duties and sales taxes less the amount of sales returns Goods plus used for self consumption, commission, rebates and discount allowed etc.

The term ' income from services' include the rewards for services to subsidiary companies in the form of dividends from it rent received compensation and miscellaneous income etc. The term "bought – in –materials includes costs of finished goods purchase, the cost of raw material consumed and the cost of stores and spare consumed during manufacturing process. This figure is further adjusted stocks of wok in progress" and finished goods. The term cost of services includes the cost of production services, power, fuel, repair & maintenance, bank charges, commission, insurance premia, selling and distribution expenses, postages & telephone bills, printings, auditing fees. Legal expenses and traveling expenses, it should be kept in mind that the employees, cost depreciation and excise duty are not included in the cost of bought-in-material & services. They are separately shown

Concept of Profitability:

The word "profitability is modulation of two words "profit' and "ability". In another words it referred to "Earning power"of"operating efficiency" of the concerned investment concept of profitability may be defined as "The ability of a given investment to earn a return from its use" [8]

Measurement of profitability is the overall measure of performance profits known, as bottom lines are also important for financial institutions. Analyzing and interpreting various types of profitability ratios can obtain creditor performance of portability.

Profitability and Efficiency:

‘ Profitability is also not synonymous with ‘ efficiency’ though it is an index of efficiency; it is regarded as a measure of efficiency and management guide to greater efficiency. No doubt, profitability s an important yardstick of efficiency, but the extent of profitability cannot be taken as a final proof of efficiency. Some time satisfactory profits can mask inefficiency and conversely, a proper degree of efficiency can be accompanied by an absence of profit. The net profit figure simply reveals a satisfactory balance between the values receive and value given. The change in operational efficiency is merely one of many factors on which profitability of an enterprise largely depends between besides efficiency, which affects the profitability.

CONCEPT OF ACTIVITY ANANLYSIS:

Sale of product is the primary object of any business enterprise. It is pivot around which all business operations are cluster. The increase or decrease of the business profits depends upon the magnitude of sale because it is the key figure in the business enterprise. Income from net sales is the lifeblood of business.

More sales more profit and less sales less profit or even there may be loss. Thus-sale are to a business enterprise what oxygen is to the human being, a very material increase in the volume of net sales has the same effect upon the business organization as an increase in the quantity of inhaled oxygen has upon the human organism.4 The quantity quality and regularity of flow of sales revenue govern the physical appearance and the internal conditions of the business organism.5 In fact with the higher volume of sales, The business operates with greater profits and effectiveness and operations are speeded.

It is apparent, therefore that the significance of any business activity can be measured in terms of its contribution towards sales. Activity ratios are turnover ratios where the significance of financial figure is measured in terms of sales of business enterprise. The approach to the activity analysis is done as follows:

(1) The growth of activity and its measurement in terms of investment.

(2) Activity in relations to total resources

(3) The conduct of activity

Growth of activity:

The growth in the firm has been measured in terms of the growth of average year' s sales over the period of study.

Activity in Relations to Total Resources:

Activity ratios are concerned with how efficiency the assets of the firm are managed or utilized. These ratios indicate the rate at which different assets are turned over in the process of doing business. The greater rate of turnover or conversion, the more efficient the utilization or management, other things being equal, resulting in higher profitability. Some times these ratios are called efficiency ratios, or investment turnover ratios. Thus, Turnover ratios reflect the relationship between the level of the sales and the various assets and a proper balance between assets and sales shows better management of assets. Different activity ratio have been computed for judging the effectiveness of assets utilization

Conduct of Activity:

The conduct of activity of an enterprise is related to the efficiency of conducting business operations. The efficiency of the conduct of activity depends upon the capacity to keep the operating cost at minimum possible level. An efficient conduct of business operations requires that expenses should always be kept at the minimum so that they may also remain below revenue resulting in profit thereby.

The operating ratio is an index of the efficiency of the conduct of business operations and analysis of operating ratio to judge the operating efficiency of an enterprise, requires a study of the main component ratio.

CONCEPT OF FINANCIAL STRUCTURE:

"Financial structure" of a business as consisting three elements assets, liabilities and capital.[9] The financial structure provides an insight into the various types of sources tapped to finance the total assets employed in a business enterprise that part of financial which represents long-term sources is known as "capital structure." This term refers to make up of long –term funds as represented by the equity share capital, preference share capital and long-term debt. To circum scribe the real area of the term "Capital structure." It may be necessary to distinguish it from term "assets structure," the assets structure refers to make-up of total assets as represented by fixed assets and current assets.

Since the balance sheet is a detailed form of fundamental or structure equation. It sets forth the financial structure of an enterprise. It states the nature and amount of each of the various assets of the liabilities and of the property interest of the owner. Stating the nature of the assets, liabilities and capital is not difficult as their amount.

The capital structure is used to represent the proportionate relationship between the various long- term-forms of financing, such as debentures, long-term debt, Preference capital and equity capital reserve and surplus. The term capital structure is frequently used to indicate the long- term sources of funds employed in a business enterprise. In other words, it can be said that it represents permanent financing of the concern. This is usually measured by subtracting current liabilities from total assets. Thus, capital structure, general reserve, preference share and long –term debts.

Significance of a Study:

The above study is made for the point of all live participants who are interested in the routine of the business organization. Those are as under.

(1) Management Point of View:

The above study plays vital role in providing such information to the management, which needs for planning decision-making and control e.g.

operational efficiency analysis provides gross profit, operating expenses analysis and profit margin. Asset management outlines asset turnover, working capital under inventory turnover, accounts receivable and payable profitability position shows return on assets, earning before interest and taxes (EBIT), and return on assets. Gesternberg stated that "management can measure the effectiveness of its own policies and decisions, determine the advisability of adopting new policies and procedures and documents to owners as result of their management efforts" [10]

(2) Important to Investor:

According to Erich A.Helfert "Importance of performance lies for owners/potential investors should know easily. The financial position of the company by return on net worth, return on common equity, Earnings per share, Cash flow per share, Dividend yield, dividend coverage, Price earning ratio, market to book value, Pay out/retention"[11.] The potential investors of the business organization in turn are interested in the current features.

(3) Creditors Point of View:

Creditors doing business with company simply study its performance by current ratio, acid test ratio, and debt to assets, equity and capitalization, interest coverage and principal coverage before lending the finance. The study of these describes real features of business organization to the creditors.

(4) Government Point of View:

Government has significance to study liquidity productivity and financial efficiency of an individual organization or industry as a wholvarious. Taxes, revenues, financial assistance, sanctioning, subsidy, to a business organization or industry as well as price fixing policies, frame outlines the key role of study for the Government lies in planning, decision making and control process.

(5) Employees and Trade Unions Point of View:

Employees are resources of the company and are interested to know the financial position and profit of the company. Generally they analyze by the comparison between past and present performnace, profit margin and cash flow of the company. Trade unions are interested to know the data of financial performance pertaining to their demands for increase in wages, salaries, facilities, and social welfare.

(6) Society and Others:

Society and others are including in external environment of the company and every business organization has a greater responsibility towards society.

In this context performance should be studied through various types of social elements such as customers investors, media, credit institutions, labour bureaus, taxation authorities, economists are interested for the study of a business organisation while society as whole also looks forward to know about the social contribution, i.e., environmental obligations, social welfare etc.

EVALUATION METHODS:

A study of liquidity, productivity and financial efficiency through profitability is made by using the following tools and techniques

[1] RATIOS ANALYSIS:

Ratios analysis is the process of determining and presenting in arithmetical terms the relationships figures and groups of figures drawn from these statements. A ratio expresses the results on the basis of comparison of two figures in numerical terms.

A ratio is a statistical yardstick that provides a measure of relationship between two accounting figures. According to Batty "Accounting ratios describe the significant relationship which exists between figures shows on a balance sheet in a profit and loss account in a budgetary control system or in

any other part of accounting organization." [12.] The ratio are customarily expressed in following ways:

1. It may be obtained by dividing one value by other. This expression is known as "Times"
2. If hundred then the unit of multiply the above expression becomes percentage.
3. 3. It may be expressed in the form of "proportion" between the two figures or known as pure ratio.
4. It may also be depicted in the form of graphs like ratio graph.

Importance:

A ratio is known as symptom like blood pressure. The pulse rate of the temperature of an individual often ratio analysis is used as a devices to diagnose the financial position of an entreprise. It shall point out if the financial condition is very strong, good, partly good, poor. As such the ratio analysis is a powerful tool of financial analysis through it economic and financial position of a business unit can be fully x-rayed.

Ratio analysis becomes meaningful to judge the financial condition and profitability. Performance of a firm only when there is comparison of present in fact analysis involves two types of comparision. First a comparison of present ratio with past and expected future ratios for the same firm, the second method of comparison involves comparing the ratio of the firm with those of similar firms of with industry average at the same point of time.

Further "Ratio analysis" presents the figures in which the net result of the financial position and problems is concentrated. They provide a co-ordinate frame of reference for the financial manage. They tell the entire story of the ' Financial adventures of the enterprise as heap of financial date are buried them. They simplify the comprehensive of financial statistics.

On the basis of above it may be concluded that ratios are very important for interpretation as they give valuable and very useful information about business.

Limitations:

Every flower of rose has its own beauty in spite of numberless thorms in the same way ratio analysis has a variety of advantages, though it is not free from limitations, some of which are as below:

1. The formula for calculating each ratio is not well standardized.
2. No standard ratios are available for evaluating the significance of each ratio.
3. Ratio ignores non-monetary factors like general economic climate, government and management policies, which vitally affect the financial health of the enterprise.
4. If too many ratios are calculted, they are likely to confuse, Instead of revealing meaningful conclusions.
5. The ratios are generally calculated from the past financial statement and thus, are no indicators of future.
6. Ratios are not exact measure of financial situation as the balance sheet and profit and loss account are based on accounting conventoons, personal judgments and recorded facts.

As ratios are simple to calculate, there is a tendency to over employ them, which lead to accumulation of mass data. However significant the ratio may they cannot replace business efficiency and decision-making. They do not provide mechanical solution to business problems.

Classification of Ratio:

Some writes have described that there are as many 42-business ratios. First of all it is necessary to ascertain the ratios for a particular study. The financial ratios may be classified in the various way. If the nature and objective of calculating each ratio is given then the customary and convenient classification from the point of view of management and investors will be:

[A] Liquidity Ratio

These ratios throw the light upon the liquidity position of a concern the main ratios are:

1. Current ratio
2. Liquid ratio or quick ratio or acid ratio
3. Inventory to working capital ratio
4. Working capital turnover ratio
5. Debtor turnover ratio
6. Average debt collection period.

[B] Productivity Ratio

1. Output to input ratio
2. Input to output ratio.

[C] Profitability Ratio

These ratios X-ray the profit making ability of the enterprise. They may calculate either on the basis of operating profit of net profit. These ratios are of two types first related to sales and second profitability. The main efficiency ratios are

1. Gross profit ratio
2. Operating ratio
3. Net profit ratio
4. Return on gross capital employed
5. Return on net capital employed
6. Return on net worth

(D) Activity Ratio

Activity ratio expressed how efficiency the firm is managing its resources. These ratios express relationship between the level of sales and the investment in various assets. The import and commonly used activity ratios are as under:

1. Total assets turnover ratio
2. Fixed assets turnover ratio
3. Current assets turnover ratio
4. Capital turnover ratio

(E) Financial Structure Ratio

These ratio highlight the management policies regarding trading on equity. The more important ratio concerning capital structure is given below.

Debt equity ratio

1. Long-term debt equity ratio
2. Total debt equity ratio
3. Interest coverage ratio
4. Fixed assets to capital employed.
5. Capital gearing ratio
6. Proprietary ratio
7. Net fixed assets to net-worth ratio

[2] TREND ANALYSIS

Trend analysis technique is useful to analyze the firm financial position and to put the absolute figures of financial statement in more understandable form over a period of years. This indicates the trend of such variable as sales cost of production, profit assets and liabilities.

The different approaches of trend analysis are as follow:

(I) **COMMON SIZE VERTICAL ANALYSIS and**

(II) **COMMON SIZE HORIZONTAL ANALYSIS**

Trend analysis helps the analyst and management to evaluate the performance, efficiency and financial condition of an enterprise.

(I) COMMON SIZE VERTICAL ANALYSIS

All the statement may be subject to common size vertical analysis a figure from the same year' s statement is compared with the basic figure selected from the statement should be converted in to percentage to some common base. The common size vertical income statement and balance sheets of Birla group of companies covered by this study are given in the study.

(II) COMMON SIZE HORIZONTAL ANALYSIS

When asking horizontal analysis, a figure from the account is expressed in terms of same account figures from selected base year. It is calculation of percentage relation that each statement then bears to the same item in the base year. Horizontal analysis can help the analysis to determine how an enterprise has arrived at its current position.

The technique of common size statement is very useful when we wish to compare the performance of one company with that of another for presentation of the data in percentage form since it eliminates problems relating to differences in organization size.

[3] COMPARATIVE STATEMENT ANALYSIS:

Statement prepared in a form reflecting financial data for two or more periods are known as comparative statements. The data must first be properly set before comparison in the preparation of comparative financial statement uniformity is essential otherwise comparison will be vitiated. Comparative financial statement is very useful to the analyst because they contain not only the data appearing in a single statement but also information necessary for the study of financial and operating trends over a period of a year. They indicate the direction of the movement in respect of financial position and operating results. Comparision of absolute figures has no significance if the scale of operations of one company is much different from that of others

(I) comparative Balance-Sheet:

Increase and decrease in various assets and liabilities as well as in proprietor' s equity or capital brought about by the conduct of a business can be observed by a comparison of balance sheets at the beginning and end of the period. Such observation often yield considerable information, which is of value informing an opinion regarding the progress of the enterprise and in

order to facilitate comparison a simple device known as the "comparative balance Sheet" may be used.

(II) Comparative Income Statement:

As income statement shows the net profit or net loss resulting from the operations of a business for designated period of time. A comparative income statement shows the operating result for a number of accounting periods so that changes in absolute data from one period to another may be started in terms of money and percentage. The comparative income statement contains the same columns as the comparative balance sheet and provides the same type of information.

As the income statement presents the review of the operating activities of the business and the comparative balance sheet shows the effect of operation of its assets and liabilites. The latter contains a connecting link between the balance sheet and income statement. Income statement and balance sheet are contemporary documents and they highlight certain important facts.

[4] FUND FLOW ANALYSIS

The balance sheet is in the nature of a showing the position of a firm at a particular moment of time. The business process is very dynamic with transactions occurring regularly, each of which affects in some way, the immediately preceding financial position. A balance sheets therefore, merely provides the picture of a fleeting condition at a point of time and if balance sheets drawn at different time are compared any different pound between the closing and beginning figures would be the result of various transaction taking place during the interim period. The business process involves a continuous inflow and outflow of funds. This funds flow analysis helps the analysis to appraise the impact of the management' s decision on the business during a given period of time.

[5] OTHER TECHNIQUES OF ANALYSIS

Several other techniques like cash flow analysis and break-even analysis are also some time useful for analysis. The use of various statistical techniques is also used frequently for financial analysis, providing a more scientific analysis. The tools generally applied are moving average, index number, range, Standard deviation, correlation, regression and analysis of time series.

Diagrammatic and graph orientations are often used in financial analysis. Graphs provide a simplified way of presenting the data and often give much more vivid understandable of trends and relationships. Pie graphs bar diagrams and other simple graphs are often used for financial analysis.

REFERENCES:

1. MOHANTY, R. P., in his article "managing technology for strategic advantages" THE ECONOMIC TIMES, (Thursday 9th Jan., 1992), p.14
2. GORDON K. C.CHEN AND ROBERT E. MCGARRAH "productivity management Text and cases". International editions Holt Saunders CBS college publication, New York, 1982 P.no.3
3. Souvenir published at IV conference of Asia and pacific accountants, New Delhi, 1965, I.P.143.
4. WESTON I FRED, "The profit concept and theory: A restatement journal kf political Economy, LXII (April-1954) p.152-170.
5. ERIC L.KOHLER, A Dictionary for accountants"(Indian reprint – prentice Hall of India Pvt.1978)
6. R.K GUPTA "Profitability, financial structure and liquidity", print well publisher –jaipur-1990 p.31
7. HAROLD W.STEVWNSION &J.RUSSEL NELSON, "Profit in the modern economy" Vora & co. publisher pvt.ltd.3 round building, bomby-21969, p.74
8. Howard and Upton "introduction to Business finance" International student edition Mc Grawhill book Co.ltd.new York, p.147
9. JOHN N. MAYOR, Financial statement analysis, prentice Hall of India, New Delhi, 1974,P.178
10. CHARLES W.GRESTERNBERG "Financial organization and management of Busiones"4th end. Asia publishing House, New Delhi, 1960,P.365
11. ERICH A. HELFERT "Techniques of financial analysis" 6th,Universal Book stall, New Delhi, 1989,p.22
12. BATTY J.: Management accountancy, MacDonald and Evans ltd., London, 1975,p.63

CHAPTER – 2
PROFILE OF BIRLA GROUP OF COMPANIES
A BIRD' S EYE VIEW

Profile of the Industrialisation

At the time of independence almost the entire production and trade were in the hand of the private sector and the public sector was insignificance, being confined to irrigation, power, Railways, ports, posts and Telegraphs and ordinance establishments. After 1951 the public sector was expanded fast both center and state and it has become significance in many fields in terms of investment, total turnover, capital information, contribution to export effor, import subsisitution etc., Industrial policy in 1948 opted or vital role of the public sector in the economic development of our country. In 1956 industrial policy resolution, opted for socialist pattern of society in which public sector plays dominant role. Contradictory to the previous industrial policies the New Economic policy of 1991gave boost to the private sector. Even then the private sector has continued to be dominant in all spheres, accounting for 80 percent of the gross domestic product and over 90 percent of the total employment. After independent the largest industrial activity was done by Birla group. The Birla group of companies in India plays an important role to develop the Indian economy. Which are mainly engaged in manufacturing the Textiles, cement, wool, metal, chemicals, agro-based products, engineering, shipping paper, roller, Electric, jute/met, and tea product, so the brief overview of these industries are given below:

CEMENT INDUSTRY:

India is world' s second largest cement producing country, next only to China. As of May-2003, there are 129 large cement plants belonging to 54 companies, with an installed capacity of 141.28 million tonne. Of these, 65 plants have a capacity of one million tonne or more. In addition there are over

300 mini plants with a total installed capacity of about 11.10 million tonne. A plant is categorized as mini plant if its capacity is less than 1.98 lakh tonne. The capacities of major companies as of May'03 are: - Larsen & Toubro (L & T) 17.0 million tonne, Associated Cement Companies (ACC) 16.07 million tonne, Grasim Industries 14.12 million tonne, Gujarat Ambuja 12.50 million tonne and India Cements 8.81 million tonne. In June 2003, L & T decided to demerge its cement business into a separate company. Grasim Industries will acquire majority stake in the demerged cement business of L & T in due course. As a result, on completion of this scheme of arrangement, Grasim Industries will become the largest player about 22% of the domestic cement capacity in its fold.

Current Scenario:

The cement production by large plants grew by 6.5% to 10.51 million tonne, while the dispatches grew by 9.1% to 10.56 million tonne in May'03 over production or dispatches achieved in May-'02. Amongst others, the impressive surge in May-'03 production and dispatches of cement is partly due to relatively steep fall in Apr-'03. The large cement plants witnessed 12.1% fall in dispatches to 9.01 million tonne, while their production fell by 11.6% to 9.05 million tonne in Apr'03. Overall, the industry witnessed modest 1.6% rise in dispatches to 19.57 million tonne and 1.4% rise in production to 19.56 million tonne in the two months ended May-'03.

The cumulative cement production by large plants was 111.35 million tonne in the year ended March 2003, which was 8.7% higher than the corresponding previous year period. The cumulative cement dispatches of the large plants were 111.06 million tonne in the year ended March 2003, which was 8.5% higher than the corresponding previous year period. The working group on Cement Industry has projected a 10% annual growth in cement demand. Accordingly, it has projected the investment requirement of Rs 17600 crore to generate additional capacity of 62 million tonne in the Tenth plan. The

statistics on GDP and cement consumption for the period 1990-91 to 1999-2000 indicate that for every 1% increase in GDP, cement consumption increases by 1.2% in India. Hence, the working group projected 10% growth in cement consumption for the above period, based on projected 8% growth in GDP.

Export and Imports:

The cement industry has capitalized on the country's long coastline and is exporting cement to its neighboring countries like Srilanka, Bangladesh, Nepal and Middle East. Being a bulky item, the global trade in cement is quite low. Cement exports fell by 7.94% to 5.8 lakh tonne in the two months ended May'03. Nevertheless, clinker exports during this period more than doubled to 7.7 lakh tonne from 3.5 lakh tonne in the corresponding previous year period. Together, the cement and clinker exports witnessed healthy 37.8% increase to 1.35 million tonne during the above period. In FY 2002-03, the cement exports increased modestly by 2.7% to 3.47 million tonne, while clinker exports zoomed by 96.0% to 3.45 million tonne. Together, cement and clinker exports increased by 34.6% to 6.92 million during this period. In view of the rebuilding efforts in Iraq, and the industry' s thrust on greater exports, current year is set to witness increased sales of cement and clinker in general, and clinker in particular. Cement being a bulky item and predominantly being consumed in relatively smaller quantities, the actual import is quite negligible. Further, the infrastructure bottlenecks in the ports also add to cost of imported cements, making them currently unviable. Further, there is effective protection to the domestic industry with 20% basic customs duty on grey cements and 25% on white cements. Add to these, the countervailing duties and non-modvatable special additional duty. Considering the current depressed prices in the domestic market coupled with the protection given to the domestic industry and the infrastructure bottlenecks in ports, cement imports on large scale is currently unviable.

TEXTILES INUSTRY:

The Textiles industry is oldest and biggest industry of the India. It is proved by researcher that the India is the birthplace of fabrick cloth. In past malamal of Dhaka was famous for ite beauty and thickness. In Indian economy this industry played important role in providing employement. Indian is also exporting the textiles in the foreigh country. The textiles indurtry like Raymond, digjam, Arunodai Mills, Jaysiyaram, Birla Corporation Ltd., are famous for its qualitible cloth. The total contribution of textiles indutry in the total industrial production is 20 percent. The textiles industry provided employement to the 35 Milion peaple in the years of 2000-001. The textile industry exported 6132.4 crores in the years of 2000-0001.Thus it plays most important role in Indian economy. The total numbers of mills were 1857 in the year of 31st December 2001.

Current Scenario:

The Indian textile and apparel industry is expected to touch $30 billion by the end of 2010 –11, while it contributes around 33 percent of the country' s foreign exchange earnings. "Life after 2005 "is a big question which while is hanging over the Textiles and Clothing (T&C) industry around the world. The equation in the industry, which was more determined by Quotas, has come to an end on 31 December 2004.With exports anticipated to provide the big thrust, many companies are already expanding to meet additional export requirements; and a new era of free trade in textile and garments has commenced. With the multi Fiber agreement (MFA) coming to an end, garments has commenced in Indian textile and garment industries will increase manifold. One of the main factors determining their competitiveness would be unit cost, where Indian has fared poorly in recent past. The unit cost depends upon factor prices and productivity level. Trade in textile has been regulated since the 1960s and since January 1, 1974 through the multi fiber Agreement (MFA) exempted the textile and garment trade from GATT disciplines, allowing industrial countries to place bilateral quotas on import from various

textile and garment products categories. This was meant to protect producers in the north and allow them time to restructure and adapt to competition from cheaper imports from the south. During the Uruguay round of trade negolementation of the agreement on textile clothing (ATC)

Although this would result in an increased market for developing nations, competition is also expected to increase manifold. Hence it can be a cause of concern for a country like Indian, where the textile industry contributes heavily to gross domestic products (GDP), industrial output, foreign exchange earnings and employment. In 2000-01,the industry contributed around 4 percent export and 18 percent to GDP, 14 percent to industrial production, 27 percent to export earning and 18 percent to employment in the industrial sector. Indian' s share in global textile industry is 4 percent and that in the global garment industry is 3.4 percent from 1991-92to 2001-02, India' s textiles and garment expert grew at annual rate of 8.5 percent. With the complete phasing out of the quota regime, one of the most important determinates of export would be the cost competitiveness of exporting country, in which India is not in a very comfortable position. The Gherzi report suggests that India needs to focus on cost reduction if it has to compete with textile Giant like china and Indonesia and minnows such as shrilanka, Pakistan and Bangladesh. It argue that while china remains the undisputed leader with cost advantage in all factors of production, India is fast losing its traditional advantages in home-grown cotton and low labour cost. The study noted that in cotton textiles beside technology, costs of materials energy, ryes and chemical and wages are crucial for India to stay cost competitive. In garment, India' s cost competitiveness is restrained by helmeted scale of operation and the use of traditional technology, as this sector was till recently reserve for or mall-scale industry. But surprisingly, India still managed to perform satisfactory in the world garment market. There is another arguementthat on the basic India' s export to the two most important markets, UE and US, in post-MFA regime; the garment sector is on a strong footing

unlike textiles. While the quota regime constrained the export of apparel to these two market, it protected the exported the export of yarn and fabric. However it should still be noted that in garments too there is no room for India to be co placement as there will be tough competition from countries like china, which manufacture on a munch larger scale using better technology.

Export and Import:

According to the data released by Apparel Export Promotion Council (AEPC), exports to the US, the single largest market, during the period amounted to 263.7mn pieces valued at US$1.3bn, thus recording an increase of 27.2% in volume and 25.5% value, in relation to Apr-Oct 03.Exports of readymade garments to the European Union (EU) during Apr-Oct04 amounted to 392 million pieces valued at US$1.4bn against the corresponding period of the last fiscal, registering an increase of6.8% in terms of volume, and 15.6% in terms of value. Exports to Canada during the period under review declined by 4.9% in volume and 2.6% value to28.9mn pieces and US$95.7mn respectively, in relation to April to October 2003.Export of garments to quota countries during the month of October 2004, have been 94.3mn pieces valued at US$380.9mn, representing an increase of 40.1% in terms of volume and 47.9% in terms of value. Considering robust growth in the fiscal so far, AEPC is predicting to achieve garment export ofUS$5.7bn during FY05.With the end of quota regime by January 2005, the industry is confident of capturing a large share of the international market, as most of the leading garment units in the country have gone in for massive expansion-cum-modernization program to emerge competitive both in price and quality. However, quality of infrastructure is a severe handicap for Indian exporters, which results in high transaction cost In terms of delay in ports, power supply, etc. Pioneer Embroideries to buy South Korean company Pioneer Embroideries of Mumbai will be buying for around Rs200mn, a South Korean company that is into manufacturing value added embroidery products and has a capacity of around 3,300 million stitches a year. The acquisition is being made so as to ramp up

capacities to produce special embroidery products. Textile sector demands a dedicated fund to restructure high cost debt The textile mills sector led by Indian Cotton Mills Federation (ICMF) has petitioned the Government on the need to have a dedicated fund for realigning the high cost debt sourced by "financially weak but technically viable" units. The current Debt Restructuring Package- which allows financial institutions to carry out debt swaps for textile units by sourcing low cost funds through the external commercial borrowings (ECB) route-has been largely ineffective in servicing the" financially weak units." Based on a Deloitte Haskins & Sells study, the federation has suggested the establishment of a textile restructuring fund, the creation of which was also suggested by the Steering Group led by former Planning Commission Member, Mr. N. K. Singh. Based on Deloitte's recommendations to ICMF, the federation has said that a fund with the corpus of Rs40bn would be able to save an estimated Rs320bn worth of textile assets from becoming redundant. Mandatory use of jute in packaging to stay Mr. Wajat Habibullah, Secretary, Union ministry of textile said those as long as jute packaging suffers from price disadvantages at the hands of synthetic packaging the Jute Packaging (Mandatory) Act will stay. The Act stipulates use of jute bags for grains at 100% and for sugar at 90%. The Government has set a target for increasing jute goods production to 19.5 lacs tons during the 10th Five Year plan from the current 15.5 lacs tons. The Government is coming out with a "Comprehensive National Policy on Jute" that would incorporate every aspect related to improving the lot of grower, jute worker as well as development of manufacturing sector. Cotton output estimate unchanged at 213 lakh bales.

Automobile Industry:

Once a car was treated a luxury item, but now no more. There has been a sea change in the scenario over the last fifty years. Still our usage of cars is well below the global standards. Once the government opened the gates in 1994, the car industry attracted sizeable FDI in India in general and south

India in particular. With this, many of the global players like Ford, Daewoo, Hyundai, Mitsubishi and General Motors came to India for their ventures. The advantages of post-liberalization era coupled with the relaxation in the government policies helped the industry to change the gear and it became one of the fastest growing industries of the Indian economy

Industry Structure:

The first car was run in Indian streets a hundred years ago. For the next fifty years, cars on the Indian roads were only the imported ones. During the earlier period of the last century, assembly units were set up in many metros and in 1946; the first assembled car in India was put on the roads. Until the introduction of Maruti cars in 1983, customers were to choose between the two models of Ambassador and Premier. With the entry of Maruti, the industry got a face-lift and with the doors opened for MNC's, more and more models started hitting Indian roads with flying colours, which lead to fierce competition among the car manufacturers. The latest entrant was Telco.

The demand for the cars increased from 15,714 in 60's to 30,989 in 80's representing a CAGR of 3.5 %. For the next ten years, the CAGR was 18.6 %, thanks to the surge in sales of Maruti. From 1990-93, there was a negative growth, followed by a brisk growth of about 17% until 1997. The year 1999-2000 was a remarkable year for the industry with a spectacular 56% growth in a single year. After that, FY 2000-01 witnessed a 7.5% fall in total sales (inclusive of exports). F.Y. 2001-02 fought back with a 5% growth in total sales with major thrust coming from the exports front. Production capacity, which is 7.27 lakh in the year 2000, is expected to cross a million in the coming years. Maruti's capacity is one third of the domestic capacity. The total market size of the passenger cars is Rs. 300 billion, representing about 35 % of the total auto industry. On the basis of the price, cars are classified as economy, mid-size, luxury and super luxury. The price ranges are as follows: up to Rs. 3,3-5,5-10 lakh and beyond 10 lakh, respectively

The economy class had the major market share of about 90%. This was due to the fact that major purchases were by first time buyers. The reasons for the increase in the first time buyers were that the car prices became affordable on account of higher disposable income, aggressive finance schemes of banks, FIs and NBFCs. With the competition from the mid-size car due to the availability of more models in this segment, the share of economy class has come down to 80% level. Region-wise north leads in the market share, followed by west and south.

However, the export scenario is not much bright in this segment. The market share of Indian cars in the world market is miniscule. Maruti started exports to reduce its net foreign exchange outflow. With the entry of MNC's, exports are expected to be better in future, as many of them like Honda are trying to use the country as an export base.

Indian cars of the earlier times lacked in technology but the entry of multinationals made superior and latest technology available to the domestic industry. The use of lighter metals in the production of cars has made them more fuel-efficient and customer-friendly.

Current Scenario:

Passengers cars and uitlity vehicles in November'03 registers the highest monthly sales in the passenger vehicle industry in the current year. The passenger vehicle segment of the Indian automobile industry comprising of passenger cars, utility vehicles and multipurpose vehicles registered a 38% growth in sales (domestic plus exports) to 84,272 units for the month ended November'03. All the three of the above mentioned sub-segments registered good growth in sales during the month. Passenger cars registered 41% growth in sales to 67,744 units. Utility vehicles registered 33% growth in sales to 11,491 units while multi purpose vehicles (in which Maruti is the sole major player) registered 24% growth in sales to 5,037 units. Passenger Vehicles roughly constitute around 10-11% of the total automobile sales in the Indian auto industry. On an m-o-m basis, overall PV sales were marginally higher.

The November figure is the highest monthly sales recorded this year, exceeding the festive sales of October 2003.

Domestic sales of passenger vehicles during November' 03 have registered 39% growth to 74,511 units. Passenger cars registered 41% growth to 58,166 units while domestic UVs registered 33% growth to 11,399 units. MPV domestic sales for the month were higher by 23% to 4946 units. After a bit of slowdown in August'03, numbers once again have sped up for the passenger vehicle industry during the last three months. The news relating to the proposed hike in prices across the industry has been attributed as one of the main reason for the November'03 performance. Besides, a rise in demand following the advent of upgraded models of MUL's Zen and WagonR are seen as other factors.

Aluminum Industry:

The Indian aluminum industry is blessed with an abundant supply of quality bauxite, the key raw material, at a very low cost. The industry has a ready domestic and overseas market for the finished product. India has the fifth largest bauxite deposits, accounting for 7.5% of the global deposits. But its installed capacity is only 3% of the global capacity. The per capita consumption of Aluminium in India is relatively poor at 0.6 kg as against 16-35 in Developed countries like UK, Japan, USA, Germany and France. Hence, there is enough scope for India to become a favourite location for building alumina refineries and smelters.

As the government continues to give a thrust to the electrification process, estimated to cost Rs 900 billion over the next decade, the aluminium industry stands to gain the maximum because 31% of the demand for aluminium comes from this sector.

Industry Structure:

The aluminum industry can be classified as primary producers and secondary (down stream) producers. Primary producers make ingots and billets (the primary forms of aluminium) using bauxite. Secondary producers

add value to the ingots and billets to manufacture down stream products like rolled products, extrusions, wire rods and foils and value additions in the above products are 25%, 26%, 8% and 60%respectively.

Earlier, the industry was under government control and at least 50% of the production was reserved for the power sector. The retention pricing mechanism, which was based on the average prices of all producers and a minimum return on equity, was the rule. This has led to a skewed product mix with shortages for others. The problem was further compounded by the vulnerable financial position of state electricity boards. This Act was scrapped in 1989 and in 1991; the government lifted restrictions and freed the industry.

The industry consists of five primary aluminium producers. They are Nalco (a PSU), Balco (wherein Sterlite group acquired strategic stake), Hindalco, Indal and Malco. Besides them, there are other downstream producers. The total installed capacity of primary aluminium is 7.47 lakh tonnes, which may reach 10 lakh tonnes by the end of 2003 with Nalco's and Hindalco's Greenfield and Brownfield expansions. The consolidation in the industry is likely to bring down the number of major payers to two or three in the medium term.

Current Scenario:

The aluminums production increased by 6.95% to 498625 tonne in the nine months ended Dec'02 over the corresponding previous year period. Part of the increase in production is attributed to lower base of the last year, when production was disrupted in Balco, on account of labour strike post divestment of strategic stake by government in favour of Sterlite Group. Except for Hindalco, all other domestic aluminium producers - Nalco, Malco, Indal and Balco reported increase in production during the nine months ended Dec'02 over the corresponding previous half-year period. However, Hindalco reported modest 0.14% fall in production to 190935 tonne during this period, due to interruption in power supply with disrupted production.

During FY 2001-02, Hindalco recorded 3.9% increase in aluminium production to 2.61 lakh tonnes. During this period, Nalco's aluminium production grew by a mere 0.7% to 2.32 lakh tonne, while its calcinated alumina production zoomed by 17.15% to 1.1 million tonnes.

Engineering Industries:

The decade of 1960-70 saw the establishment of a number of central engineering undertakings like B.H.E.L., Hindustan aeronautic ltd., B.H.P.V., Praga tools and State undertakings like Hyderabad allwyn, and APSRTC. Investment in engineering industries rose from Rs. 890 lakhs in 1971 to Rs 46112 lakhs in 1983 and units increased from 36 to 104 between 1970-75 machinery manufacturing increased 98 % in product value in Hyderabad, Visakhapatnam and Krishna Districts. Automobile industries started in 1980 and scooters and repair works, came to the stage of "Cabstar" Light trucks by mid 1980' s H.H.E.L., Ramachandrapuram, Bharat Heavy plates and vessels, Began to Manufacture heavy engineering equipment for internal and export markets.

Tea Industry:

The Tea Industry is one of the major traditional industries in the Indian history, ageing almost 185 years. The first tea plant was discovered in 1815. As one of the widely preferred global beverages, tea has the scientific name of Camellia Sinensis.

India is the largest consumer and producer of tea. In terms of employment, it is the second largest industry by employing more than a million people directly and 2 million people indirectly, of which 50% are women. The main tea producers are India, Sri Lanka, Kenya, Malawi, Indonesia and China. The Tea Industry is also the one of the country's major foreign exchange earner.

Industry Structure:

Basically, there are three types of tea, which are black, green and Oolong tea. Black tea is the most popular type of tea. It is produced from the top two leaves and the bud of the tea plant. Black tea is popular in India and is manufactured in two different ways, namely CTC (Crush Tear and Curl) and orthodox methods. CTC method requires a CTC machine to crush and break the leaves. The orthodox method requires the tealeaves to be rolled in a roller to break and release the chemicals. Black tea manufactured by the orthodox method is preferred in West Asia, North Africa and CIS countries for its strong colour and taste. Oolong is a semi-oxidized whole-leaf tea. This type of tea is not produced in India.

Green tea is non-fermented, and produces a clear, aromatic, delicately flavoured tea, traditionally popular in China and Japan. This is considered to be the healthiest among all varieties of tea. Based on the region they are classified as Darjeeling, Assam and Nilgiri, each having its own colour, strength and flavour. In India, there are 1,120 tea estates, out of that 700 belong to big companies and about 300 belong to small companies. Big plantations have in-campus tea processing facilities, where the tea grown in the plantations are processed immediately. The market size of the industry was Rs 6,364 crore. The biggest player is Hindustan Lever, which has a market share of 25 %, followed by Tata Tea with 13%. The other leading companies are Eveready Industries, Duncans, Goodricke and Warren Tea.

Normally, tea transactions are carried through the six auction centers in India at Siliguri, Guwahati, Calcutta, Coonoor, Coimbatore and Kochi. The Indian Tea Industry has two major tea producing regions known as northeast and south. The northeast accounts for 75 % of the production covering 80 % of the total land coverage.

Based on a survey, tea accounts for 90 %, filter coffee 4 %, malted health beverages 2%, instant coffee 2% and carbonated soft drinks just above 1% of total consumption. Squashes, concentrates, mineral water account for a minuscule part of the consumption. Tea penetration is at a level 77 % with 89 % in urban area and 73% in rural areas.

Current Scenario:

Tea production fell by 3.5% to 702.12 million kg in the ten months endedOct'02. Category wise, CTC production fell by 4.1% to 617.17 million kg, Orthodox production increased by 2.4% to 81.14 million kg and production of other teas fell sharply by 25.2% to 3.81 million kg during he above period. Tea production in North India fell by 3.1% to 540.86 million kg while in South India the fall was steeper at 5.1% to 161.26 million kg in the ten months ended Oct'02 over the corresponding period of the previous year. CTC production fell by 4.1% to 484.45 million kg in North India and by 4.0% to 132.73 million kg in South India. Orthodox tea production surged by 9.1% to 53.56 million kg in North India, but fell sharply by 8.6% to 27.58 million kg in South India. The Calcutta Tea Traders Association reported that in the 49 weeks ended10th Dec'02, the average auction prices of CTC tea fell by 10.5% to Rs65.98 per kg, Orthodox tea prices fell by 3.7% to Rs 76.50 per kg and that of Darjeeling tea fell by 11.3% to Rs 130.54 per kg over the corresponding previous year period. The Indian tea industry is worried, as the domestic tea consumption growth was dismally low 4-5% in the past few years. The year 2001saw a dismal 1.54% growth in domestic tea consumption from 650 million kg in 2000 to 660 million kg in 2001.

The Indian tea industry is also worried by a continuous fall in average tea prices by 4.75% in 1999 and further sharply by 15.23% in 2000. The average auction prices in India slipped from Rs 76.43 per kg in 1998 to Rs 72.80 per kg in 1999 and further down to Rs 61.71 per kg in 2000.

The sharp fall in average prices, was witnessed in South Indian tea, which slipped from Rs 68.79 per kg in 1998 to Rs 57.10 in 1999 and further down to Rs 44.64 in 2000. On the other hand, North Indian tea prices increased from Rs 80.22 per kg in 1998 to Rs 80.57 in 1999 but nose dived toRs 70.35 per kg. As a result of continuous fall in tea prices, the domestic customers moved away from packed tea to loose tea for the past two years uptoOct'01. However, there are signs of recovery and the Packed tea market was flat in Nov'01 and grew by 1% in Dec'01. The industry hopes that further incremental shift away from packed tea is unlikely and that hence there will not be further fall in sales of packed tea.

Currently, HLL is the market leader with 30% market share and Tata Tea follows it with 19% market share of packed tea. Other leading players in packed tea segment include Godfrey Phillips India, Eveready Industries, Duncans and Gujarat Tea Processors.The tea production in calender year 2001 increased marginally by 0.85%to 853.71 million kg. Region wise, North Indian tea production increased by1.37% to 650.76 million kg while South India tea production fell by 0.77%to 202.95 million kg during the above period. Category wise, CTC production fell marginally by 0.09% to 757.94 million kg while Orthodox tea production rose sharply by 11.19% to 89 million kg while other tea production fell by 13.5% to 6.77 million kg in the calender year 2001. Considering the better prospects of exports for Orthodox tea, the industry is consciously shifting towards Orthodox tea production.

Region wise, CTC production increased marginally by 0.09% to 591.49 million kg in North, while South registered a 0.74% fall in production to166.45 million kg in the calender year 2001. During the year, Orthodox tea production surged ahead by 20.38% to 54.20 million kg in North but fell by 0.62% to 34.81 million kg in South. Production of other teas during the above period fell sharply by 15.51% and 6.87% to 5.07million kg and 1.69 million kg in Northern and Southern regions respectively.

Agro-Industry:

Agriculture is the backbone of the Indian economy and continues to account for up to 23% of GDP. About 60% of the country' s workforce and 70% of the population are dependent on agriculture. Therefore health and growth in agriculture is of vital importance for the health and growth of the country' s economy. Needless to say, agriculture itself is dependent on an adequate availability of fertilizer at affordable prices.

Infrastructure:

The Indian fertilizer sector, with an investment of about Rs 26.000 crores, an annual fur novel of RS 33.000 crores and total installed capacity of 17.1 million tones of N & P, ranks third in the world. With 60 plants producing nitrogenous and complex fertilizers besides a large number of single super phosphate units, the Indian fertilizer industry presents a wide spectrum. It is highly complex and heterogeneous consisting of plants with a wide variety of feedstocks, capacity, technology vintage EST. Of the total production capacity of about 12 million tones of nitrogen 39.4% comes from natural gas 26% from naphtha, 12.2% from mixed feed stock 9.3% from fuel oil and 12.7% from external ammonia supply. For the prophetic production, entire sulphur, 90% of rock phosphate and two third of phosacid is met from imports while entire potash is imported.

The union budget 2002-03 brought an increase in levy of special additional duty (4%) on rock phosphate and sulphur and an increase in railway freight, which increase cost of production and distribution of fertilizers. AT the end of the years, subsidy on domestic urea during 2002-03 was Rs.7499 crores which s. 1000 croroes higher than budget allocation of Rs.6499 crores. The increase has been mainly due to steep increase in prices of feedstocks i.e. naphtha, fuel oil and LSHP. On the other hand a revised estimate for concession on decontrolled P & K fertilizers at Rs.3500 crores is lower than the budget allocation of Rs. 4224 crores. Reduction in concession reflects the

lower besides the impact of a drop in process of imported raw material particularly phosacid.

Current Scenario:

The country witnessed its severest monsoon shorfallsince 1987-88 with rainfall 19.35 % below normal, 17 states were declared drought –hit-and the gross cropped area fell by 29 %. Water storage in major reservoirs was less than the last ten-year' s average level. The shadow of drought loomed heavily on this year' s food grain production estimated to be 184.06 million tones or 13.20 % less than the previous year. During the year he availability of fertilizers in the country was satisfactory on account of self-sufficiency in production of N & p and sluggish growth in consumption owing to adverse weather conditions. Fertilizer consumption suffered a major setback during the year under year review after registering marginal growth of 3.4 % during previous year. Consumption of all nutrients declined by 7.4 % to 16.083 Million tones from 17.36 million tonnesduring 2001-02.

Consumption of urea at 186.30 lakh tones was 6.5 % lower than previous year' s consumption of 199.17 lack tones. DAP consumption at 54.3 lack tones fell sharply by 12.10 % from last year' s level of 61.80 lack tones. Owing to decline in consumption during this year, import was restricted. DAP import was 0.37 million tones and Mop 2.532 million tones while practically there was no import of urea.

In the country marketing area Karnataka and Andhra pradesh experienced one of the worst droughts in 50 years while Maharashtra experienced Normal rainfall with prolonged dry spells. Deficit and rainfall in AP and Karnataka adversely affected fertilizer consumption in both states. Karnataka Witnessed declined in Fertilizer consumption by 13.3 % (est.) and Andhra Pradesh by 15.20% (est.) over last years while in Maharasdhra the consumption declined marginally by 3.90 % (est.)

Sales of agro chemicals marginally dropped to Rs 16.32 crores compared to rs.17.38 crores in the previous year. The market for agro-chemicals was

subdued with demand estimated to have dropped by 30% in cultivated area owing to deficit/scanty rainfall and scarcity of irrigation.

Paper Industry:

Paper Industry is one of the oldest industries in India, with the first paper mill having been commissioned in 1812 in the eastern state of West Bengal. The industry is highly power and capital intensive and is cyclical in nature. With Internet revolution and e-commerce taking centre stage, the growth rates in the industry are likely to be moderate in the long term.

Industry structure

The industry, based on raw material consumption, can broadly be classified as wood-based units, agro residue-based units and waste paper-based units. Similarly, on the basis of end-use, it can be classified as manufacturers of cultural paper, industrial paper, specialty paper and newsprint. While the country is self sufficient in cultural and industrial paper, it is overtly dependent upon imports for newsprint.

The industry, with over 400 mills spread all over India, has an installed capacity of about 6.2 million tonne. Of this, 36 mills are in the large-scale sector and the rest in the medium and small-scale sector. The industry is highly fragmented that the installed capacities of the 36 large mills are almost equal to the installed capacity of 370 mills in small scale and medium units. Further, over 22% of the Industry's sales are from top eight producers. The leading listed companies in the Industry are Ballarpur Industries (BILT), Tamilnadu Newsprint (TNPL), J K Paper, West Coast Paper Mills and Andhra Pradesh Paper Mills.

Current Scenario:

According to a study by Crisil, the demand for paper and paper board is expected to rise at a CAGR of 5.8% from 46.1 lakh tonne in FY 2000-01 to 61.25 lakh tonne in FY 2005-06. However, the capacity during this period, is likely to rise by 2.1% only during this period. As a result, in FY 2002-03 and 2003-04, the operating rates and paper prices are expected to rise.

The paper industry is witnessing a one time rise in demand on account of the recent change in telephone numbers in India in general, and Mumbai and Delhi in particular. The demand for higher value added paper has increased oflate as the corporate's printers are busy churning out letters of change in telephone numbers to their customers.Production of paper, paper products and printing, publishing & allied industries grew by 2.3% in the quarter ended June'02 as reflected by increase in index of industrial production of the same to 169.1 in the above period from 165.3 in the corresponding previous quarter.

The domestic manufacturers are afraid of a spurt in import of paper due to softening of global prices and the low import duty. This is bound to severely affect them, as they are unable to match global prices. Further, anomalies in excise and customs duty in certain segments has only aggravated the situation. For instance, the import duty on light weight paper is 5%, while the excise duty on such paper manufactured in India is 16%! Hindustan Paper Corporation, wherein 74% equity stake is likely to be sold through global tender, plans to increase its capacity by 25% to 2.5 lakh tonnes, at a capital outlay of Rs 250 cr. Simultaneously, it plans to upgrade the qualityof all varieties of paper, to improve realisations. It also plans to trim its total workforce of 3,300 by 10% through VRS at a cost of Rs 15 cr.

BRIEF HISTORY OF BIRLA GROUP: -

Their family like the vast river the beginning of Birla has been small. They hail from Rajasthan. The place of called marawar is a Rajsthan.the businessman of marwar is known as marwari and the term marwari came to cover the entire business community of Rajasathan. They mainly from shekhawatt, which comprises the two, present day district of SIKAR and JHUNJHUNU and are located to the north west of princely State of Jaipur. The land is still poor, semi- desert, bounded in the land be the ragged Aravalli hills. There are few towns within its boundary and PILANI the hometown of Birlas is one there made famous by the establishment of the BIRLA

INSTIUTE 0F TECHNOLOGY AND SCINCE (BITS) attracting student from different parts of India.

Birla are masheswari vaishyas who were original (Kshatriyas). Some time in ninth century the forefather of Birla "Behad Singh" took to business his name in Rajashthan dialect was corrupted to Behad. Behadala and finally to bidla and Birla.[1] The main body of Birlas settled budhavli village in Rajasthan, when three or four offshoots spread to other villages and towns. This birla branch first went to Nawalgarh and to pillani the nearest rail link today are chirawa in Rajthan and loharu in Haryana

Around 1857 one of the momentous periods in Indian history. Shiv Narain Birla the grand father of the famous four-birla brothers left pillani. He came to Ahmedabad and from there took a train for Bombay. Even then it was the biggest trading center in western India in course of time he amassed great wealth before passing away in 1909.

His son Baldev was followed him to Bombay his firm traded a sugar, silver cotton and other commodities. He soon made his mark. The British government conferred on him the title of Raja –Bahadur in 1918. The governor Of Bihar and orissa awarded him the title of Raja in 1925. When he was in varansi on the bank of Ganga, he died the year of 1956 at the ripe old age of 93. Baldev had three daughter and four sons. His four sons had built a business empire

JUGAL KISHORE (J.K) (1883-1967); -

He was the eldest of the four brothers. He was moved to Calcutta and earned a reputation as a trader. It was a city ruled by hard bargaining and over bearing British businessmen mostly of Scottish origin who had backing of the Raj. Competing with them was very difficult job.J.K was determined to curve his own place he sent his representatives to chine and Japan. He was the fist Indian to import textile from Japan and successfully compete with imported British textiles. The strategy worked and paid handsome dividends

RAMESHWAR DAS (R.D) (1892-1973): -

He was second brother. He had settled his business in Bombay. He concentrated on trading in various commodities. Very soon he became an important trader. He had settled up a numbers of ginning plants for cotton and established a network of sales. Besides he put up a number sugar mills, vanaspati and light engineering factories

GHANSHYAM DAS (G.D) (1894-1983):-

He was the third brother of four Birla' s son. He was very popular businessman. He had close connection with Gandhiji. He started his business career as jute and gunny broker in Calcutta. He was elevated to the position of dependent status. The jute industry was in the hands of non-indians.G.D proved ever since that he had" green fingers' ' for industry and every one of his units had become a money-spinners. He becomes a legend in his own lifetime. His success in business constitutes district landmarks in Indians modern economic history G.D felt that Indian business should be got organized. He was a founder member of the Indian chamber of commerce, Calcutta, 1926. And the federation of Indian chamber of commerce and industry at New Delhi -1927

BRIJ MOHAN (B.M) (1905-1982):-

He was the youngest of the famous four Birla.whose contribution to the economy development at India has been notable. When he was 21 years old, he appointed managing director of pvt. Ltd. He died in January 1926.He had set up many industries such as sugar paper, insurance and automobiles.

BUSINESS EXPANSION: -

The pedigree of Birlas reflects the course of economic history of Indian since the turn of the present century. Their firm Shiv Naran Baldev das 1879 in Bombay and the firm Baldev Das Jugal kishore (1900) in Calcutta traded in cotton, sugar, seeds, opium, silver, and textiles and have earned crores of rupees.

The business community of Rajsathan to which Birlas belong, is one of the most successful in business in modern India. They have sprawled all over the country and have made strides a speedy.

Ghansyam Das birla made up his mind to become an industrialist in his own right. And in 1918, he started a managing agency house under the name and style of Birla brother pvt. In Calcutta with the capital of rupees twenty lakhs in 1926, when Brijmohan was 21 years old he was appointed managing director of this company and continued as such till he died in January, 1982

From Trader to Industrialist:-

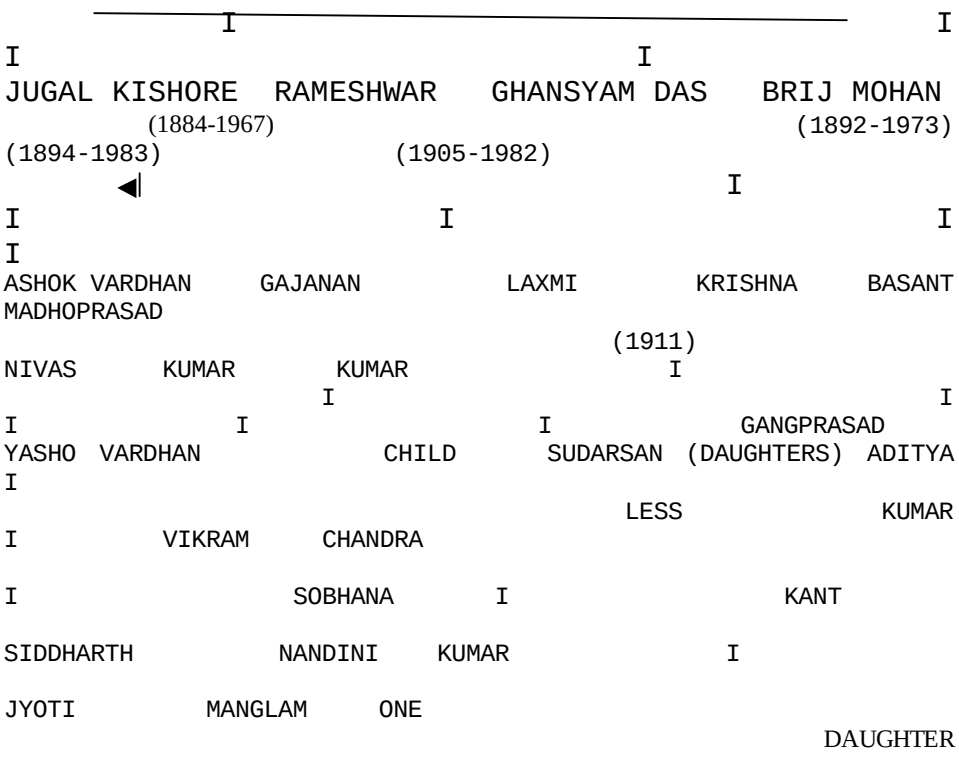
Birla' s first introduction into industry was in cotton textiles and jute. Birla built his first jute mill in 1919 in Calcutta and a cotton textiles mills in Delhi 1920. These mills were set up by RD and GD.They have started Jiyajee Rao cotton mills in Gwalior in 1921 and the story of Birla' s growth in the field of industries. Here the accounting system followed by Birlas has evoked international interest following recent write-ups in the London Financial Times and the New York based business international money report. This system called "parta accounting". Originated from trading practices, and is now applied with refinement to operations. The annual budget into a monthly basis, and further sub divided for daily evaluation. The budget itself of expenditure grounded under broad heads.

Each machine also is separated cost and its daily output then rated. This reveals daily machine wise production cost realization and profit or loss. A daily performance report is prepared to indicate deviations from the budgeted figures in respect of helps to take corrective measures, if any in short the accounting procedure places emphasis on efficiency and serves as a warning system to check losses**".**

It is the traditional Marwari of system of monitoring and control. G.D.Birla had refined this system by insisting on more detail and insisting on rigid compliance. He developed a series of informed estimates of hoe much it should cost to manufacture a particular volume of production, sell it and

DIAGRAM NO.- 2.1

THE FAMILY TREE.[2]



generated a specified profit. His son BK and grand son aditya recently convened a conference of his top executives from all over the word to search for the methods to further refine the system and for the various units to learn forms each other. Deviations from the "PARTH' ' are reported daily to birla' s office in Bombay "if you have employed more labour of used more raw materials on that day it will show. If you produce less that will show too"[4] say Birla. In addition to the daily reports, the head of every unit (and his aides, if required) meet Birla at least once a more for an intensive review unit' s performance and for setting new targets. During these meeting in, problems are discussed and all necessary decisions taken.

G.D. purchased kesoram cotton mills Calcutta and Hindustan times in Delhi and established Birla cotton mills in okara Lahore in 1937.meanwhile.

In the 1930's B.M launched new industrialist and services line the: sugar paper and insurance. He established the first sugar mill at sidhawalia in Bihar, and the second was started at seohara in U.P.

Thereafter he negotiated with the German firm of voiths to supply a complete unit for an integrated pulp and paper mill in the heart of the bamboo forests of Orissa. This was an orient paper mill, which went into production in 1939 in Brajraj nagar (Orissa); he established another factory in Madhya pradesh, which is the largest paper factory in the country.

In 1935-36 Birlas brothers have only 10 giant industries: 4 cotton mills, 5 sugar mills and a jute mill. But after the Second World War they have 22 big factories, with the capital of 20 crores.

India's industries development falls in to two distinct phases –one which took places haltingly in the pre-independence era and the other thereafter. The post independence progress has, no doubt, been faster, but it has also been checked on account of paucity of resources, policy constrains, and lack of sustained political will.

In 1935 the Birla brothers established a factories known as "Texmaco'' to make cotton textiles machinery "CIMMCO'' a factory for working heavy electric machines was established in 1945.

In 1946 Mr. Birla brother began to build a big factory to make motors. It could take its final and full shape in 1950. "The Birlas purchased sir silks and sirpur paper mills form the Hyderabad state Government which were modern mills of their times. In this way these European firms came under Indian management by 1952.''[5]

The Rayon mill in Gwalior was established in 1947. Which remained the largest of its kind till 1964. It was also the first to establish industries with foreign collaboration and with imported machinery.

As Mr. Birla wanted to have a steel factory of his own like the Tatas. So he established "Hindalco" at Runukut, near the Rihand Dam in utter pradesh in 1958.Its systematic production began in 1962.Looking to the

increasing consumption of cement in the country he bought the "mysore Cement" In 1965, and established more cement factories around it Thus the Birla Brothers made a rapid progress in the field of cement in the decade of 1960-1970.Mr.aditya vikram, the great son of Mr.Basant Kumar who received his degree in chemical engineering from M.I.T (America) in 1946, established the first factory named as "eastern spinning Mills' near Calcutta.

During the same decade, Mr. Krishna Kumar Birla launched his "India steam ship" and "Ratnakar shipping" companies in to the word of ships' and "zuary agro chemicals" in the field of agrochemicals.

As a result of these efforts, the Birla brothers made an enormous speed in the field of industries. Mr. Madho prasad widened the scope of "BIRLA JUTE" and introduced many new projects in to Mr.Chandrakant the son of Mr. Gang prasad began to run and manage "Hindustan motors" Mr.Sudrasan the son of Mr. Laxmi Niwas took up the charge of the companies like "O.C.M." "Universal electric"and"Digvijay"Mr.Ashok vardhan, the son of Shree Gang Prasad, enlarged "Jayshree tea" "Hind Gas" "Jayashree textiles" "Bharair ways" "E.C.E." "Century Enka" "Mangalam cement" "Manjushree plantation ltd". "Mangalam Timber ltd."

Also introduced old mills like kesorama and century mills in new industrial fields. In the last sixties, the fear of big business had led to a cessation of license for the Birlas. Despairing of getting any licenses for either setting up plants or expansion, Aditya decided to look abroad. And there lay the seeds of what is today a Rs. 1300 crore empire. He now controls 35 companies in six different countries. Aditya Birla' s major Indian company has of very high turnover in India.

Contribution to National Economy

The house of Birlas was in the thick of the economic and political movements. Birla' s economic performance in the post independence period was certainly better than the record before the advent of independence. The

'Birlas' aim was not only profit making but also expediting the industrialization of the country and reconstructing the nations economy.

Mr.G.D.Birla wrote to the secretary of late prime minister pandit Jawaharlal Nehru in 1953 "I have no desire at all to establish new industries for earning profit my aim to increase national production. Apart from this G.D. once said, is has been the policy of the House of Birlas not to built up business just with a view to accumulating capital but to develop unexplored line, harnessing the underdeveloped resources of the country, promoting know how, creating skilled labour and managerial talent, spreading education and above all. Adding to the leaders of the country who have been struggling hard to build a new independent India, free from want, employment, ignorance and disease."[6]

"G.D. was one "of the sponsors of the Bombay plan 1954, a maiden attempt to prepare a blue print for planed economic development of the country."[7] A report of the industrial licensing committee says that the Birlas have direct control over some 200 industrial units and indirect control over another 70.Barring iron and steel, the Birla empire sector of industry.

Social contribution of the Birla' s:

Raja Baldevdas Birla have constructed templestankswells, Dharmshalas, and clock towers at different pilgrimage centers in India. He set up Sanskrit and ayurvedic colleges. Hospital and dispensaries at various places. His eldest son Jugal Kishor gave his generous help in the beginning of the Banaras Hindu University. Laxminarayan temple in New Delhi and other temples throughout India including Mathur and kurukshetra are a standing testimony to his intense love for the Hindu religion. While Rameshwar das established "Bombay Hospital" in Bombay having over 800 beds and the finest equipment and facilities.

In 1929 Ghansyam das Birla set up the Birla education trust at pilani which runs many education institutions. It was founded with assets of over

rupees six crores and has become one of the largest private educational endowments in India. This trust also runs the Birla institute if technology and science Pilani, which was established in 1964. The B.I.T.S. is all India institute for higher education deemed to be a university by the government of India.

TABLE NO.- 2.1
MAJOR COMPANIES OF BIRLA GROUP

SR. NO.	NAME OF THE UNIT	YEAR FOUNDED	NATURE OF INDUSTRY
1	Hindustan	1956	Metal
2	Mrsore cement ltd	1958	Cement
3	Zuary agro chemicals	1967	Chemical
4	Texmaco	1939	Engg.
5	India shipping	1928	Shipping
6	Ratnakar shipping	1960	Shipping
7	Sutlej cotton mills.	1934	Textiles
8	Birla cott.spg. &. Wvg.miis	1920	Textiles
9	Century textiles & ind.	1897	Textiles
10	Kesoram ind & cott.mills.	1919	Textiles
11	Jayshree tea & ind.	1945	Tea
12	Bharat comm.& ind.ltd	1945	Textiles
13	Gwalior rayon mills mfg.& wvg.	1947	Textiles
14	Shree Digvijay woolen mills.	1948	Wool
15	O.C.M	1972	Wool
16	Universal electric	1961	Electric
17	Jiyajee Rao cotton mills.	1921	Textiles
18	Birla mfg. Company	1920	Jute/met
19	Bihar alloy steels.	1965	Metal
20	Hindustan motors	1942	Auto
21	Orient paper ltd	1936	Paper
22	Hyderabad asbestos cement	1946	Cement
23	National engineering	1946	Rollers
24	India rayon & ind ltd	1958	Rayon
25	Birla corporation ltd	1989	Cement
26	Birla V.X.L	1948	Woolen
27	Birla power & solution	1984	Engine

Source: Bombay Stock Exchange Official Directory.

TABLE NO. -2.2
GEBERAL ACTIVITIES OF 147 COMPANIES RUN BY BIRLA IN INDIA

Sr. No.	Field of Activities	No. Of Company
1	Cotton textiles	15
2	Woolen textiles	2
3	Rayon textiles	2
4	Jute textiles	5
5	Tea plantation	2
6	Cofee plantation	1
7	Coal minning	3
8	Bauxite minning	1
9	Edible oile and seeds	4
10	Sugar	7
11	Automobile	1
12	Cycle	1
13	Engineering	10
14	Electrical goods	2
15	Chemicals	7
16	Cement	10
17	Paper	2
18	Shipping	2
19	Salt manufacturing	1
20	Investment	26
21	Trading	10
22	Managing agency	5
23	Publication	5
24	Property dealers	10
25	Iron and steels	1
26	Misc.mfg. Activities	4
27	Mis c non -mfg.activities	6
28	Non-ferrous metals	2
	Total	**147**

Source: Balance sheets and annual reports of the companies

"Once G.D expressed his desire to court arrest during the freedom movement, but GANDHII told him "the country needed money. Earn money and invest it for national welfare.G.D.earned money and spent it on welfare activities. G.D.always contributed to GANGHIJI smark nidhi, the Patel smark nidhi and other public welfare activities"[8]

Birla have donated their grant palacial residence in the Ballygunge area of Calcutta to the national for setting up a "technology museum apart from financing the planetarium in Calcutta, Bombay and Jaipur.

BRIJ MOHAN established two important centres, the Birla institute of scientific research (B.I.S.R.) and the Birla institute of technology (B.I.T.) and at Ranchi (Bihar). He established the Hindustan charity trust of which he was the chairman till his death. The Calcutta medical research institute was established in the year 1969.it has 300 beds for indoor patients and a larger number of cases of kidney transplantation and open-heart surgery has been performed in the institute

The already completed venateshwara temple in Hyderabad and laxminarayan temple in Bhopal and Jaipur are not only the places of veneration and worship but also a fine blend of traditional and modern architecture.

There is no arena of human need in which the Birlas have not helped. Their charities have helped hundreds of institutions and created as many more. The Birla is a household name in India. There is hardly any state in India where there is no Birla presence. In the item of the value of assets, the Birlas run neck with the Tatars, another big business house in common pariayance. Abroad the Birlas have out paced the Tatas.

Overseas Operation:

The Birla' s have not only spread their ventures all over India but have also proved their excellence and created goodwill in the international

industries field. The houses of Birlas have created their niche in the word market.

Birlas are operating industries enterprises in quite a few countries. "Immediately after India gained political independence, Birlas were tempted to accepted to explore oil in Trinidad. A source of energy which was destined thee decade later to cause a trauma in international economic relations". [9]

G.D established cotton mills in ethopia and a company at jug (Switzerland). Aditya vicar Birla established indo-Thai synthetics in Thailand in 1968 after that new venture in Indonesia, Philippines and Malaysia in additional to Thailand while G.D established industries in Africa.

"In the year 1964 a company was incorporated by B.M and his son G.P.in Nigeria for the manufacture of engineering goods. It increased its range of products, turnover, assets and profits manifold. It is one of the largest engineering factories in Nigeria." [10]

"The Nigerian government commissioned Birla brothers (1968) for providing Know how and technical services for operation of it idle paper plant. The work has under taken substantial expansion of its capacity from 40 tones of paper made from imported pulp to 200 tonnes pulp and paper." [11]

"Another company was incorporated in 1974 in Nigeria to render and provide know how and services to projects in Nigeria and elsewhere. This company is currently providing such services to various projects for manufacture of asbestos products, paper, engineering products, soft drinks, steel projects, agriculture and irrigation". [12]

"A company was promoted in Kenya for manufacture of pulp and paper. This mill has in production since 1975 and has exceeded its rated capacity and has been running efficiently and profitability." [13] this is the largest Indian joint venture abroad. Birla brother invested several thousands of crores of rupees in South-east Asia and Africa.

As part of the strategy for exploring new market, Birlas started exploring production. The indo-Thai synthetics company earned foreign exchange by

exploring to Europe, Indonesia, Australia, Afghanistan, and etc. western countries like the U.S.A., U.K, West Germany and Australia began to accept the products of National engineering industries ltd. In his anxiety for the industrial uplift of the under developed and developing countries, he began the export of looms and machines to Nepal, Bhutan, Afghanistan, Uganda, Tanzania, Sudan, South Korea, Iran and Ethopia.the Birlas also earned a lot of foreign exchange by way of exploring wagons to iron, Iraq and Malaysia

Aditya Birla' s first venture out of India was about 20 years ago. Now he controls as many a 35companies in six different countries and a colossal. 1300 crores business empire overseas. Birlas are also the only Indian entrepreneurs having plants in Thailand, Malasia, Indonesia, and Philippines. Their first venture abroad was the indo-Thai synthetics company ltd. Near Bangkok in Thailand, which was set –up in 1969 with a modest investment of Re.1.2 crores to make cotton and synthetic yarns. It has now more than 64412 Spindles and sale yarn worth Rs.more than 96 crores.

Birla' s largest overseas company, however, is in Malaysia. The pan century edible oils, set up in 1976 has the capacity to redefine one million tonnes of palm oil. Birla rightly claims, "fifteen years ago when he started, we were the smallest of our kind; [14] pan century is also the largest explorer of palm oil in Malaysia and last year it exported its entire production.

Sources of Inputs:

Indo Thai also became the spring board for setting up six other companies in Thailand itself (vide, table1.6) these companies make a wide range of products like synthetic yarn. Viscose staple fibre, carbon black, acrylic fiber, hydrogen, peroxide, sodium stipoly phosphate (s.t.p.p.) and synthetic and cotton fabrics. Over the last twenty years not only has the number of companies gone from one to seven but it also added to their assets, production and sales. The combined turnover of all these units in the year of 1989 was Rs 470. Crores

Thairayon' s viscose fibre for example, is exported to Japan the U.S and Europe. Similarly, Thai carbon black started in 1980 with technology from Phillips carbon black of the U.S. has one the most sophisticated carbon black plants in the word"[15.]

"Different Birlas companies in India have shares in different overseas venture. Grasim, for example holds equity shares in Thai Rayon Thai carbon and p.t. carbon and p.t. Indo-Bhart Rayon in Indonesia"[16]

"The Birla group has set up another minority –owned subsidiary in Manila in partnership with Filipino Businessmen as part of its investment diversification programme.the subsidiary, indo-Phil corn chemical inc. will produce ethyl alcohol, vitamin c products for the domestic and export market. The firm is the fourth one established by the group in the Phillipines"[17]

One the Birla group of companies is the Indian Rayon setting up joint venture with a state owned company in Egypt. The new company is setting up a Rs. 31 crores project to manufacture 10,000 tonnes per annum of carbon black. Birla was apparently chosen a partner because of his experience is running carbon Black plants, one in India and another in Thailand.

New Birla Family Set Up:

The question of division of the Birla family' s prorety began to raise its head after the death of Sh. Ghansyam Dasji in 1983.it came to be openly admitted unavailable by 1986 and resulted in the division of almost all the prominent factories in 1987.

The principles and ideas kept in mind during this division are given as under:-

1. A factory established by a member individual shall be claimed by the same member.
2. A factory will possibly go to same member who has particularly been looking after it.
3. All of the member shall be expected to obey and follow the intentions if their elders.

4. All of them shall buy one another' s shares at centain|fixed rates. On the basis of these four points the division took place thus:

(I) The sugar Mills established Sh.Rameshwar Dasji went to Sh.Krishna Kumar Birla, smelting factory to Sh. Madhava Prasadji Birla and the other factories to Sh. Ashokji Birla.

(II) The division of the factories established by sh. Ghanshyam Dasji took place as under:

(III) Hindustan aluminium and Gwalior Rayon group were claimed by Sh. Aditya Birla.

(IV) Jeeyajee Rao cotton mill, Maysore cement, central India machinery Co. and CIMMCO were handed over to sh. Sudarshan and siddharth

(V) Kesoram and Century went to SH. Basant Kumar Birla.

(VI) Shri Madhav Prasad got the possession of Birla jute.

(VII) Shri Krishna Kumar Birla was chosen for the possession of Sutlej cotton, Birla Mills –Delhi, texmaco and Hindustan Times All The companies established by sh. Brij Mohanji Birla were claimed by sh. Gangprasad except the two Sugar mills, which were handed over to SH. Krishnan Kumar Birla.

Future Prospects of Birla Group of Companies in India:

The Wide View of Scenery:

The dynamism and vision of the Birla group gave birth to an industrial group, which manufactures a very wide range of products. Largely due to its efforts, foresight and zeal the group has become one of the largest private sector business conglomerates in our country. Natural resources, no doubt made the Birla plough back their savings ungrudgingly into new venture augmenting the national wealth by making use of unproductive and idle. Manpower and the creative talent are available in the country. The Birlas

enlarged some of their main firms to the extent that they could capture 5.36 percent capital in the private sector. Apart from this G.D once said "it has been the policy of the house of Birlas not to build up just with a view to accumulating of capital but to develop unexplored lines, harness the underdeveloped resources of the country. Promotion of know-how create skilled labour and managerial talent, spread education and above all, added to the efforts of the leader of the country who have been struggling to build a new independent India free from want employment ignorance and disease.

Increased production could alone result in economic development. For this he exhorted labourers and workers to work hard and shun slogans. At the same times, he encouraged industrialists to explore the available nature resources of the country by introducing the latest technology.

The Birla group achieved significant growth during the last 30 years. Birla' s philosophy of investment is also distinctive. He is not concerned if industries pass through temporary bad patches. He is more concerned with long terms demand. After having achieved full expansion and development in any particular product. The Birlas adopted the policy of introducing new fields of different products in the same company.

Due to the policy of future development the companies like century textiles and industries, Indian rayon & Industries Grasim industries, Birla jute and industries, Kesoram industries Hindalco, Zuari agro limited etc. were introduced new fields .out of them some top giant companies future plans of expansion and development are as follows

The companies that Birlas controls have an ambitious agenda of putting new projects and modernization, Century textiles industry has decided to expand and modernize following projects

Textiles Including Rayon:

1. Textiles Mill Recently the Mahanar Gas has started supplying piped natural gas for generating power & steam. As a part of cost reduction excise, we have decided to install subject to permission from

government of maharshtra necessary plants for co-generation of 6 M.W power & steam, which is expected to be operative by December 2004.

2. Century Yarn and century denim would be installed in order to reduce high power cost of the grid; the capacity of the existing plants site is of 6 W.M. The same is expected to be operative by December

3. Continuous spinning machine for VFY is latest machine, which raise the about 3 tonnes yarn per day depending on denier combination and the required machinery for this purpose is being, imported from Germany. The increased production should be available during the first half of 2004.

Cement:

1. Manufacturing capacity of century and maihar cement units is being increased by about 8 lac tones by close circuiting of cement mills and installation in peregrine. Increased capacity is expected to be commissioned by first half of 2004.

2. Order for 10 MW turbines has been placed for Manikgarh cement unit for increasing captive power generation capacity. Old turbines of 5 Mw is proposed to be discard after commissioning of the new turbine. This additional capacity is likely to be commissioned by December 2004.

Puls & Paper:

Initiatives to reduce cost of fuel are being taken by installing a multi boiler and other machinery for technical up gradation of the plant, which are expected to be completed by end of calendar year 2004.

Capital Expenditure:

The total capital expenditure of the company on all the above projects is estimated to be Rs. 165 crores.

Sutlej Ind. to transfer all Textile activities into wholly owned arm:

The Rs.525-crore Sutlej Industries Ltd, a member of the K.K. Birla Group of companies, has decided to transfer all its textile activities into a wholly owned subsidiary, which has been named Sutlej Textiles and Industries Ltd. The board has decided that one share of Sutlej Textiles and Industries would be given to the shareholders for every one share of Sutlej Industries. At present, Sutlej Industries has three factories located in Rajasthan, Jammu and Gujarat. For the year Ended March-31, 2005, the company registered a turnover of Rs 525 crore against 517 crore in the Previous year.

The company's net profit was Rs 16 crore. Meanwhile, sources said Sutlej Industries had planned to enter the readymade garments and home Furnishings business by the end of the current calendar. Year. Sutlej Industries is mostly into spinning and weaving of cotton, synthetic and blended yarn. It is doubling its capacity from 85-lakh meters per year to 170-lakh meters. Sources said the expansion Programme would cost around Rs 65 crore.

Grasim plans Rs.100cr. expansion for Bhiwani plant To enter blended Cotton Market:

The textile division of the Rs 4,000-crore Grasim Industries Ltd, the flagship company of the Rs 27,000-crore Aditya Birla group, has charted out an Rs 100-crore expansion-cum-modernization programme forits Bhiwani plant. The division, which is predominantly a producer of polyester-viscose fabrics, has decided to enterthepolyester-blended cotton fabric market in a big way. He was in the city for the launch of a new range of fabric under the Soffeel brand name. The product consists of lighter to medium weight fabrics in finer counts in different blends of polyester, viscose and modal. Talking about the expansion-cum-modernization programme, he said, Grasim Industries is expanding

The weaving capacity at its Bhiwani plant to 10 lakh meters a month from the existing level of sevenlakh meters a month. The plant's fabric processing capacity is 15 lakh meters a month. Currently, the company is outsourcing the rest of its fabric requirements. The capacity expansion programme will start from next month. Meanwhile, Grasim has decided to enter the blended cotton market. Currently, there are about 15significant brands in this sector, of which Arvind is the market leader.

About management team Aditya Birla says " The largest element in their pay packet is their freedom"[18] The heads of each units in Birla' s companies enjoys a great deal of independent, both within the company and in their relationship with Birla**.**Anand Rathi, Sr.president of India Rayon' s cement division says, "It' s like being an enterprneur"[19]

The crown prince of aditya Birla' s vast industrials empire and his only son Kumar Mangalam Stands out from contemporaries. Kumar is keenly aware of though not overwhelmed by the expectations surrounding him. He had completed the M.B.A. courses at London University. A qualified Charted accountant. Kumar is quite clear on his future courses when he says "my role would be to dovetail with the growth route of the organization which is poised to go global" [20] "He believes his M.B.A. which gives him a helicopter view of business" [21] should be invaluable.

INTRODUCTION OF SELECTED UNITS:

Field of activities of Birla group is very wide and working under nine groups manufacturing different products such as cement, paper, aluminum, automobiles, agro products, engines textiles and woolen. Resecher has selected 16 sixteen companies of Birla group, Brief introduction of all 16th selected units has been given below.

CEMENT:

(**1) HYDERBAD INDUSTRIES LTD.: -**Established in 1946, producing asbestos cement products, the registered number is 01 656, the ownership of this with Birla c.k.Group.the company manufacturing building materials like

asbestos cement sheets, pipes and fittings, prefabricated buildings, steel structures and aerocon panels. It also produces joining, thermal institute products, earthmoving machinery and other products. The company' s plants are located at Faridabad in Haryana, Kancheepuram in Thailand, Rewari in Hriyana, Dumha in Jhakhand, Hyderabad in Andhra pradesh and Hugli in west Bengal, in may 2003 the company acquired stakes in Malabar Building products ltd.

(2) MYSORE CEMENT LTD:- this unit was incorporated in 1948.ownership of this unit is of Birla S.K.Group. The main activity is to produce cement, the company, a part of S.K.Birla Group, manufactures cements using dry process technology, at its plants located at ammasandra in Kamataka, Demoh in Madhya pradesh and in Uttar pradesh.in December 1998,the company roped in Nesher Israel cement enterprises As co promoter. InJune200, the company hived in off its cement &power units in to separate company. As June 2003, non-promototers held around 65 percent of the equity in company.

(3) SHREE DIGVIJAY CEMENT CO. LTD.:- the company was incorporated in 1939.It belongs to the Birla aditya Group. The main activity is to produce cement. It was taken over by the aditya Birla Group under Grasim industries around 1998.Shree Digvijay Cement Company was earlier managed and controlled by the Bangar Group. As of December 2002, promoting held around 60 percent of the equity in the company. The company has negative net worth since September .

(4) BIRLA CORPORATIION LTD: - established in 1989.ROC.registered 21-3334. Ownership-Birla M.P. the main activity is to produce cement. It was founded around 1919 as Birla jute manufacturing company at Calcutta. But it' s name was later changed to Birla corporation ltd. to rejects its status as the flagship company of the M.P.Birla group the cement division of Birla corporation ltd. has six plants two each at satna (M.P.) and chitorgagh (Rajsthan) and one each at Durgapur (W.B.) and Raebarli (U.P) These plants

manufacture varieties of cement like ordinary, Portland cement 33.43 and 53 grades. Portland pozzolana cement. Fly ash-based PPC. Low-alkali port cement, Portland slag cement, low heat cement and Sulphate Resistant cement.

TEXTILES:

(5) CENTURY TEXTILES MILLS.:-The company was incorporated in the year 1897. In the name of " the century spinning and manufacturing company limited" but after that the that the name of company was changed in to " century textiles and industries ltd."As form the date of issue in favour of the company by the register of companies Maharashtra of fresh certificate of incorporation in 1986.Roc registration number: -11-163Ownership: - Birla B.K. group

It is the part of the Birla B. K. it is promoted by pilani investment & industry corporation ltd. kesoram ind. Ltd.Orient paper ind. Ltd.and Birla coporation.till 1951 it had only one industrial unit – cotton textile mills. Since than company has diversified in to other products like yarn denim, viscose, filament rayon yarn, caustic soda, sulfuric acid, salt, cement and pulp &paper. It has also entered in the business of tram shipping and is also engaged in the activities of properties &land development, builders &floriculture.

The main plants are located at Jaipur, chhatisgarh (cement) Jamnagar (salt, sulfuricacid, carbondisulfhide, hydrochloricacithane, Maharashtra (yarn) nainital, Utteranchal (paper and pulp) satna, Madhya Pradesh and Chandarpur (cement) mumbai, maharashtra9 cloth and cotton yarn) it is an iso 9001 and 14001 certified company. And GOI recognized star trading house.

(6) KESORAM INDUSTRIES LIMITED: - the company was founded in the year of 1919 .in the beginning the name was "kerorama Ind. And cotton mills" after the name was changed in to "kesoram industries limited" the registration No. Is 883660.this Company is managed by Sty B.K. Birla.The main activities of this company is to produce Rayon & fram parts paper, spun, pipes &foundries cement, refectory, Birla tyres. The Sty.B.K.Birla is the

chairman. There are three major subsidiary companies given below (A) Bhart General & Textile industries ltd. (B) KICM investment (C) Asam cotton mills ltd. (D) Sf shree estates ltd.

(7) INDIAN RAYON AND INDUSTRIES LIMITED: - the company was incorporated in the year 1958 in the name of "Indian Rayon corporation" the company' s registered office is situated in junagadha-veraval road, veraval – 36266 (Gujarat). The main company was established with main object of manufacturing the ' Rayon' since then the companies have been diversified in to various field such as cotton and polyester fibre, viscose staple yarn, cement, insulator, white cement and carbon. In view of the increasing demand for finer denier yarn in the market, the company managed by shri aditya v. Birla. He is also the chairman of the company it is under the Group of Kumar Mangalam Birla.

AUTO & ALUMINIUM INDUSTRIES

(8) HINDUSTAN MOTORS LTD.:-Hindustan motors ltd. automobiles Manufacturing company and flagship company of the C.K.Birla was established just before Indian independence in 1942.commencing operations in a small assembly plants in part OKHA near GUJARAT, The manufacturing facilities later moved to uttarpradesh, west Bengal in 1948, where it began the production of the ambassador model. The company also produces the passenger cars, multi-utility vehicles power shift transmission products, engines, power products units and heavy engineering equipment. In 1971 Hindustan motor ltd.diversified its activities by setting up an earth moving division at tiruvallam near Chennai tamilnadu for the manufacture of earthmoving equipments such as dumpers, fronts and loaders, crawler tractors and so on.

(9) HINDALCO INDUSTRIES LTD: - Hindalco industries ltd. was incorporated in 1968. The main activity is aluminium. A Hindalco industry is a major integrated aluminuim and aluminuim products manufacturing company in India managed by the Aditya Birla Group. It has manufacturing

capacities for aluminuim metal, rolled products, extruded products and conductor Rend raw rods. Hindalco' s plants are located at Renukoot in Uttar Pradesh and its captive power plant is located at Renusagar.40 kms away from the aluminuim plant. In 1997-98 the company commissioned an aluminuim foils plant at Silvassa in Gujarat.

ENGINEERING INDUSTRIES

(10) TEXMACO LTD.: This company is also known textile machinery corporation (Texmaco) ltd. Texmaco ltd was incorporated in 1939.It is part of Birla K.K.Group.Zuary investment ltd. a Duke commerce ltd, Poddar Heritage corps ltd and Zuary industries are among its promoters. It started as a textile company, and has diversified in to engineering in 1954.It started a new engineering division at agarpara for manufacturing of stationery tube boilers Later it expended further to manufacture industrial and hydraulic structural water tubes, other types of boilers, pressure vessels, heat exchangers, cranes, diesel road rollers and various other sophisticated heavy engineering equipment. In 1954 it started a steel foundry at Belgharia, where it produces steel castings & ingots and structurals.

(11) BIRLA POWER &SOLUTION LTD.:-The company was incorporated in 1984.The company was managed by Birla Ashok Group. The main activity of this unit is to produce portable generating sets. The company is also manufacturing Muiti-purposes engines and other ancillary products.

WOOLEN INDUSTRIES

(12) BIRLA V.X.L. LTD.: This company was incorporated in 1948.It is a part of the Birla S.K.Group.It is promoted by my sore cements ltd. Janrdhan trading company ltd. and Birla Eastern ltd. It mainly manufactures woolen textile like blankets, Shawls, cloth, Garments, and woolen yarn at its plants located at Amritsar PUNJAB, Jamnagar GUJARAT and Fridabad HARIYANA

TEA INDUSTRY

(13) JAYSHREE TEA&INDUSTRIES LTD: -The company was incorporated in 1945.The company is managed by B.K.Birla.The main activity is making tea products. The main plant is located at Kolkata.the company is listed on Kolkata, Mumbai and N.S.E.

PAPER INDUSTRIES

(14) ORIENT PAPER INDUSTRIES LTD:-Orient paper & ind. Ltd. was incorporated in 1947.It is a part of the Birla C.K.Group. Central India industries ltd, Hindustan discounting company ltd. Nirmala Birla and Gwalior finance corporation ltd are among its promoters. It is a diversified company and is engaged mainly in production of paper & pulp cement and electrics fans. Its cement plants are located at Adilabad, Andhra Pradesh and Jalgaon, Maharashra.It manufactures paper and pulp at its plant at Shahdol; Madhyapradesh.Thasubsidiary companies are Air condition corp. ltd. O.P.I.export ltd.

AGRO INDUSTRIES

(15) ZUARI INDUSRIES LTD: -This was incorporated in 1967. The company is managed by Birla k.k Group. The main activity is to produce mixed fertilizers. Zuari.Manufactures and sells monogamous and phosphatic fertilizers. It also manufactures cement and furniture and markets agricultural products such as seeds and pesticides. The fertilizer division of the company manufactures ammonia (for captive consumption) urea. Dap, and other complex fertilizers. These fertilizers are marketed under the brand name of JAIKISAN; SAMPURNA, URAMPHOS and SAMRAT.Zuari industry has manufacturing plants at Goa, Andhra pradesh and Tamil nadu. It is a K.K. BIRLA Group company. The company was promoted by Birla Gwalior pvt. and Armour & company, Chicago, US. In February 1995 zuary industries acquired the cement plant of texmaco ltd. the plant located at yerranun tala in Andhra pradesh was auired. The commercial production of Urea and ammia started in May 1973. Production of N.P.K commenced in March 1975. During 1983-84 the company set up a dia ammonium phosphate plant. In feb1998,

India furniture products limited was amalgamated with Zuary industries .In October 2001, Zuary leasing & finance corp. ltd. merged with the company.

(16) GRASIM INDUSTRIES LIMITED. The Gwalior rayon silk co. ltd. established in 1947 to produce artificial fiber, rayon.ragistered office of this company is at Birla gram, Nagda, Madhya, pradesh.its rights of capital and the management are in the hands of Mr. Aditya v. Birla who was the Chairmen of this company the started in 1954 with a capacity of 9.7 million lbs. per annum. The main object of the company is to produce ' Rayon' and other products like viscose filament yarn, rayon tyre cord, regular viscose staple fibre, acceptable, filament yarn/fibre.and high wet modulus (h.w.m) fiber.

Operation in India:

A. The new fibre varieties developed in the company' s research centre, the tra name-GRASI-HIGH, GRASIBOW and GRASI RIB have received god response from the textile industry

B. Pulp and staple fiber div. (kerala)

C. Pulp and Gransiline division-harihar

D. Chemical division, Nagda

E. Cement division

F. Textiles- (i) GWALIOR SUITINGS (GWALIOR)
(ii) BHIWANI TEXTILES (BHIWANI)

CONCLUSION:

On the basis of above information a researcher has concluded following points -Profile of industrialization -Brief history of Birla groups – family back ground, contribution to the nation and to the society, and Brief History of selected units

References:

1. SHASTRI, DEVDUT (ED.) AAK BINDU: aak Sindhu, (Pryag: Sh.Jugal Kishore Birla, Samvat 2025.1968) p.114.
2. BUSINESS INDIA, (June 15-28, 1987), P.53
3. JAJU.R.N Maru Bhumi Ka Vaha Megh, (Hindi) (New Delhi: Raj pal and sons), p.261.
4. BUSINESS INDIA, (Dec, 24, 1990-JAN.6 1991) P.65
5. COMMERCE, (New15, 1952), p.92
6. TAKNET, D.K., Industrial Entrepreneurship of shekhwati Marwaris (Jaipur: Kumar Prakashan, 1987) p.120
7. Ibid, p.121
8. Ibid, p. 1229.
9. CHENTSAL RAO, P B.M.Birla, his deeds and dreams, (New Delhi: 1985), p.2.
10. Ibid, p.29.

1. Ibid, p.29
2. Ibid, p.30
3. Ibid, p.30
4. BUSINESS INDIA, (dec.24, 1990-jan.6, 1991), p.67
5. BUSINESS INDIA, (dec.24.1990-jan.6.1991), p.67
6. Ibid, p.67
7. BUSINESS INDIA, (nov.16, 1990-dec.9.1990) p.16
8. INDIA TODAY, (Dec.24 1990-Jan.6 1991), p.66
9. BUSINESS INDIA, sep.16-29, 1991), p.46
10. Ibid, p.48

CHAPTER – 3
RESEARCH METHODOLOGY

PROBLEM IDENTIFICATION:

The Birla group of companies in India plays an important role to develop the Indian economy. Which are mainly engaged in manufacturing the Textiles, cement, wool, metal, chemicals, engineering, shipping paper, roller, Electric, jute/met and tea. The Birla group played an important and multidimensional role of uplifting and taking our country out of lamentable state of industries as we experienced soon after independent. Our overall progress and around prosperity owe great deal to the multifaceted role performed by some of very important Birla companies. Now Birla group of companies are working in the field of service sector and giving good contribution to the national economy. Thus Birla group of companies has the leading position in the Indian as well foreign markets

Financial soundness of a business enterprise largely depends upon the liquidity productivity and profitability of the business enterprise. The liquidity can be achieved by managing the different parts of working capital such as receivable management, cash mgt.and proper debt collection policy. An output is obtained by the combined input of a number of factors like labour, material, capital, land and organization. The ratio between output and one of these factors of input is generally known as the productivity of the factors considered, the ratio between output and all these factors is known as total productivity. It is considered as a measure performance of the economy as a whole. In the broadest concept, productivity may be taken to constitute the ratio of all available goods and services to the potential resources of the group of the country. The problem of increasing productivity implies the full proper and efficient utilization of the available resources of men – machines- money – power – land- capital etc. productivity cannot have a mask attack on wastage of every type and in every sphere. It constantly urges to find better, cheaper,

quicker, easier and safer ways of doing job, manufacturing a product and providing a service. It aims at the maximum utilization of resources for yielding as many goods and services as possible, of the kinds most wanted by consumers, at the lowest possible cost. The profitability can be achieved after control over the cost of production. In recent years, cost of almost all elements of production like cost of raw material consumed, wages cost, excise duty, power and fuel cost, interest burden, administrative expenses, selling and distribution expenses etc. have been increased heavily. On the other hand, selling price of cement, textiles, automobiles, woolen, engineering, tea, paper, and chemical products is decreased. In these circumstances, to keep the progress of business enterprise is very essential for management in present environment, to achieve the profit it tends to introduce various control techniques over expenditure and get maximum output.

A study of liquidity productivity viz a viz-financial efficiency can be classified on the basis of persons interested in the analysis. Generally external and internal parties are interested in such analysis of study. Objectives of both these analysis are different. An external analyst has to depend upon the published information of financial statement, which is not enlightening them. While internal analysis knows every thing regarding the information provided in the financial statements.

Different analysts always make analysis or study of financial performance knowingly, generally, external analyst' s analysis the information as per their requirements. Financier is interested in the financial and liquidity position. A shareholder is interested in the profitability. Management is interested in the productivity and operational efficiency. Thus various stakeholder of business enterprise like management, investors, bankers, financial institutions, creditors, employees, government, economist, prospective investor' s etc., look at liquidity profitability and productivity of the business concern.

Survey of the Existing Literature:

There is wide range of literature available on different company of Birla group in conforming to its dynamic value and significance of intuitive nature. A good dealing in analytical part of literature exists at broad levels like size and technology, problem Associated with productivity, financial performance, and capacity utilization. Relevant existing literature and studied have been clipped below. A researcher has studied of this literature for the purpose of gaining insight into the problem,

Some institute like DGCI&S, IEEMA, Commerce research bureau ELCINA. The economic times, CETMA etc have made attempts to study the general problem related to industry.

Poddar presented two important books in 1962 and 1966 in which he elaborated all the facts regarding various aspects of the industry. Institutions as C.M.A., Association of trade and industry, commerce research bureau. Economic times, Tariff commission, National productivity council etc.have made efforts to study the general problems in historical perspective.

India association of trade and industry having made study on the basis of annual reports of the leading 19 companies which accounts for 90 % of the total production in India and published. It covered analysis of the financial trend and productivity on the basis of the study of the consolidated balance sheet and profit and loss account of these companies. It also compared various features of these companies It also compared various features of productivity and profitability with other cement producing countries like U.K. U.S.A.Belgium and Japan.

Chakravarty and reddy made study on ratio analysis as major tool for financial performance by studying 22 ratios of productivity, profitability

proprietary, liquidity and turnover groups of the industries for the period from 1961 to 1971.

Dr. D.K Ghosh covered 18 private sector companies having a paid up capital of Rs. 50 lacks or more for the period from 1972 to 1996.In this study he analyzed the balance sheet assets and liabilities and condensed common size income and expenditure statement.

Dr. Kumar Bar Das published a comprehensive book in 1987 which covered period from 1970 to 1980.He concluded various aspects like factor productivity, location degree of competition capacity utilization, size efficiency financial performanace, Distribution pattern and government policies with respect to pricing and distribution. He indicated that all profitability ratios decrease gradually and became negetive for 1973-74 and 1974-75 but improved gradually thereafter.

Dr.Pramod Kumar published a Book in 1991, "Analysis of Financial statements of Indian industries." The study covered the 17 private, 5 state owned and 1 central public sector companies. He studied analysis of activities, assessment of profitability, return on capital investment, Analysis of financial structure, Analysis of fixed assets and working capital. In this research he revealed various problems of cement industries and suggested remedies for the problems .He also suggested for the improvement of profitability and techniques of cost control.

In study made by KPC research division in April –June 1991 covered 26 companies of all sizes. The articles published in productivity quarterly magazine revealed that the profitability from of 26 companies examined at least 11,had shown losses. An attempt was made to analysis the productivity and performance ratio of the industry by identifying the major problem-area and the prospects of solving them.

A researcher had made a study for the degree of M.Phil. On "Interpretation and analysis of financial statement of two selected units Birla group" for the period covered from 1991-1999.He has made an attempt to analysis financial strength liquidity profitability and activity analysis by using various ratios analysis common size analysis. He made several suggestions for the improvement of profitability liquidity and activity position of industry. In his analysis he indicates various reasons for higher cost, low profitabilty, and inefficient use of internal resources.

Recently in the year 1998 a study was made by pro. S.J.parmar on "profitability analysis of cement industry in Gujarat state" for the period from 1998-89 to 1994-95.He had made an attempt to analyze financial strength, liquidity, profitability, cost and sales trend and social welfare trend by using various ratios analysis, common size analysis and value added analysis. He made several suggestions for the improvement of profitability of industry. In his analysis he indicates various reasons for higher cost, low profitability, and inefficient use of internal resources.

In the year 1988 one book published on "working capital structure of private enterprises" by J.Panda and A.K. Satapathy. It covers a study of 10 private sectors Company engaged in production of cement. The study covers the various aspects of working capital period from 1965 to 1985. He had analyzed working capital position of selected units as a whole and as well as individual analysis. Finally He had made suggestions for the better utilization of various components of working capital.

An article on study of cement industry (Where is it heading?) was published in "Chartered Financial analysis" in May-1996.It revealed complete scenario of various aspects cement industry. It found out strength and weakness of industry, as well as opportunities and threats.

R.S Tiwari published an article "Cost reduction in cement industry" in the "Management accountant" in Nov 1998. The article includes suggestion for reduction and control of cost factors.

Kathuria Sanjay had written an article titled "Competitiveness of India Industry" in 1995, which gives details such as export propensity (where the ratio of export to gross output applied), Domestic resources cost for industry etc.

Recently in the year December 2002 a study was made by pro. Manish M. Chudasama on " Analysis of cost structure of Indian Textiles Industry" He had made an attempt to analyze Cost structure, direct expenses and profit, Indirect expenses and profit, and how these factory affects the cost structure of textile industry by using various ratios analysis, common size analysis. He made several suggestions for the improvement of profitability of industry lower the cost used in cost structure.

Miss Nandini Jaimini published an article "Evaluation of cash management performance of the selected Textiles Mills in Rajasthan" in "Indian Journal of Public enterprise" in 1988-89. She made analysis of selected textiles units by using various liquidity ratios and concluded that the inadequate cash balance to meet their currently maturing obligations. She suggested various measures to overcome this deficit of working capital.

Thakker N.M has written a book in March 1949 on "Indian cotton textiles Industry. In his book he has made study of Indian cotton textiles industry and gave over all picture of Indian cotton textiles industry.

Love et. Al., (2005) have presented a paper on "Determine of external equity finance evidence from the Indian corporate sector" and he analyzed financing pattern of the Indian companies and found while debt to asset ratios have been relatively stable, nominal debt growth has slowed down in recent

years. Thought the period of study (1994-2003), Banking financing as a share of total debt has increased, while borrowing from non-Banking financing institute fell sharply. In term of difference across firms, the finding is that debt levels increase with firm size. Smaller firms have especial less debt relative to large firm if they are young. Furthermore, while the ratio of debt to assets has been relatively stable fro large firms, we observe a significance decline for smaller firm for that he developed the panel data and time series models to empirical determine the various factors, which affect the Indian corporate sector' s demand for equity capital.

In the year of 2002 Dr.Sugan C. Jain has written a book on "performance appraisal automobile industry" In his study he has analyses the performance of the automobile industry and also presented comparative study of some national and international units. The operational efficiency and profitability had been analyzed using the composite index approach. He made several suggestions fro the strengthening the financial soundness improving profitability, working capital the performance of fixed assets.

An article on study of tea industry (An overview of the Indian tea industry) was published in "The Management accountant" in June-2004 .It revealed complete scenario of various aspect of tea industry. It found out Fluctuation in India' s tea production, consumption and exports scenario. He had also found out strength and weakness of tea industry.

Prof. Amit Mallick and Debasish sur presented an article on tea industry "Working capital and profitability a case study in interrelation which was published in the management accountant, November 1998.It explores the correlation between ROI and several ratios to working capital management. They made analysis of the impact of working capital on profitability by using simple correlation between ROI and each of some important ratios of working capital.

The study was made by Kar A.P who had written an article in December 1995 On "Need for cost and Management control in Indian tea industry" in Management accountant. It gives different cost control techniques to control the cost in tea industry.

Dutts S.K Written an article on "Indian tea industry an appraisal" which was published in Management accountant in the yea of March 1992. He analyzed the profitability, liquidity and financial efficiency by using various ratios.

An article on study of Agro-industry, chemical, Drugs & Pharmaceuticals Industry "Risk and Return analysis" (Case study of selected industries) was published in" Journal of accountant &Finance" in April1994.It revealed Complete scenario of various aspect of Chemical, Drugs&Pharmaceuticals and electronics Industry It found out different ratios such as Return on investment, Debt/equity and Risk classification That how risk and return related and how it influences on the selected industry.

Ahindra Chakrabati published an articles "Performance of public sector enterprises a Case study on fertilizers" in "The Indian journal of public enterprise" in the year 1988-89. He made analysis of consumption and production of fertilizer by public sector; he also made analysis of profit and loss statement. He gave suggestion to improve the overall performance of public enterprise.

Title of the Problem:

The title of the problem is "**A Study of Liquidity, Productivity Viz – A - Viz Financial Efficiency of Birla Group of Companies**." The performance analysis of a business organization largely depends upon the relationship between five major parts of performance analysis, those are given as below

1. Relationship between cost of production and the selling price affect them. In the age of globalization this is a very vital question to any industry.
2. Productivity and efficiency played key role in Birla group of Industry. The study of selected companies shows comparatively lower standards of productivity.
3. Profit and profitability are also other considerable things. Due to high degree of competition the profit margin is decrease.
4. There are certain uncontrollable and controllable factors affecting profits of the companies. It is hypothesized and by controlling the controllable factors, the companies can improve their profit and profitability.
5. There are rapid changes in Liquidity position (working capital) determining factors i.e. manufacturing process and business fluctuation.
6. The companies faced multifarious problems during the study period and still it is facing many problems are tackled properly; the performance of the company will improve.

This study is based on the secondary data drawn from published annual reports of Birla Group of companies under study. Various studies have been conducted under the university faculty but no significant research work seems to have been under taken on the interpretation and analysis of performance of industry. Present attempts will be an original contribution in this field as the problems of the study is unique in every aspect.

OBJECTIVES OF THE STUDY:

The objective of the study is to analysis and interprets the liquidity, Productivity vis-à-vis. financial efficiency of Birla Group of companies. The objectives are as under:

1. To examine liquidity position
2. To assess and comment on determinants of the production, and productivity.
3. To measure the financial efficiency
4. To assess the financial strength
5. To analysis the activity of the firm
6. To suggest ways and means to improve performance

Hypothesis:

"A hypothesis is a special proposition, formulated to be tested in a certain given situation as a part of research which states what the researcher is looking for."[1] In the research study, two hypotheses have been tested, these are as under:

Hypothesis based on Chi-square Test:

Chi-square test is useful for inter comparison. For establishing casual relationship regression line of variable "Y" on variable "x" has been calculated and with the help of regression equation of "Y" on "X" calculated value of 'YC' has been computed for appropriate variables as per the statement of Null Hypothesis (Ho) "There is no Significant difference between actual and computed variables on the regression line in selected Birla Group of companies." If the calculated value of Chi-square (X^2) is higher than the table of Chi-square, The arising differences are significant and hence Null Hypothesis is rejected otherwise accepted.

Alternative hypothesis (Ha): The statement of alternative hypothesis describe, as "there is significant difference in actual and computed variables if the Null hypothesis is accepted, the alternative Hypothesis will be rejected or vice –versa.

Hypothesis based on Kruskal Wallis:

"This tests the rank randomization analogue of the observation randomization."[2]

One-way Analysis of Variance Test:

It is useful for inter-unit comparisions. The following null and alternative hypotheses have been tested on the basis of kruskal Wallis one-way analysis of variance test.

Null Hypothesis (Ho):

There is no significant difference between the productivity ratios of the units or all the ratio of selected Birla Group of companies come from identical populations.

The acceptance of the null hypothesis would suggest that there is no significant difference between the productivity of the selected units, which means that the productivity ratios of the units came from identical populations, in such Birla Group of companies as the comparison of the productivity will have little significance. In contrast, the rejection of the Null hypothesis will reveal that there is significant difference between the productivity ratios of the units, suggesting the usefulness of comparisons the level of significance used in this case will also be at 5 percent, while degree of freedom will (total no. Of units –1) or (16-1=15) in the present study.

As per empirical study the self-existent assumptions are as under:

1. The data of industry by the postulate. However it is possible to sketch conclusions of the individual company.
2. There are such areas where the performance can be improved by the effective management of resources. These areas include production, Productivity, financial efficiency and liquidity position.
3. There are certain controllable and uncotrollablefactors which by the effective to the profit of the companies. It is hypothesized and by controlling the controllable factors, the company can justify their profit performance
4. The selected units faced problems during the study period and presently also. If the problems are tackled properly the performance of

liquidity, productivity, and financial efficiency stand and will be improved as per determined.

HYPOTHESIS FOR PROFITABILITY ANALYSIS

(1) There is no any significance difference between the gross profit ratios of Birla group of companies.

(2) There is no any significance difference between the operating ratio of Birla group of companies

(3) There is no any significance difference between net profit ratio of Birla group of companies

(4) There is no any significance difference between the Return on gross capital employed ratio of Birla group of companies

(5) There is no any significance difference between the Return on net capital employed ratios of Birla group of companies

(6) There is no any significance difference between the earning per share ratios of Birla group of companies

HYPOTHISIS FOR LIQUIDITY ANALYSIS

(1) There is no any significance difference between the Current ratio of Birla group of companies

(2) There is no any significance difference between the quick ratio ratios of Birla group of companies

(3) There is no any difference between the inventory to working capital turnover ratio of Birla group of companies.

(4) There is no any significance difference between the working capital turnover ratios of Birla group of companies.

(5) There is no any significance difference between the debtor turnover ratio of Birla group of companies

(6) There is no any significance difference between the average debt collection ratio of Birla group of companies.

Scope of the Study:

Field of activities of Birla group is very wide and working under nine groups manufacturing different products such as cement, paper, aluminum, automobiles, agro products, engines textiles and woolen. Researcher has selected 16 sixteen companies out of them two company is related to K.K Birla group, three are related to Kumar mangalam group, Two companies are related to S.K Birla group Three companies are related to B.K Birla group, Three companies are related to C.K.Birla group, one company is related to Birla M.Pgroup, one is related to Aditya Birla group and one related to ashok group. For the purpose of analysis samples have been classified in the following way

- **CEMENT INDUSTRY**
  1. Hyderabad Cement Ltd.
  2. Mysore Cement Ltd.
  3. Digvijay Cement Ltd.
  4. Birla Corporation Ltd.
- **TEXTILES INDUSRY**
  1. Century Textiles Ltd.
  2. Kesoram Ind. Ltd.
  3. Indian Rayon & Ind. Ltd.
- **AUTO & ALLUMINIUM INDUSTRY**
  1. Hindustan Motors Ltd.
  2. Hindalco Ind. Ltd.
- **WOOLEN INDUSTRY**
  1. Birla V.X.L. Ltd.
- **ENGINEERING INDUSTRY**
  1. Texmaco Ltd.
  2. Birla Power & Solution Ltd.
- **TEA INDUSTRY**
  1. Jayshree Tea & Ind. Ltd.
- **AGRO INDUSTRY**
  1. Zuari Ind. Ltd.
- **PAPER INDUSRY**
  1. Orient Paper Ltd.
- **DIVERSIFIED INDUSTRY**
  1. Grasim Ind. Ltd.

A liquidity, productivity and vis-à-vis. financial efficiency of the above companies covered in the present study fully examined. The conclusion drown and suggestions attempted will provide practical guidance to the management of the companies to promote for improvement of liquidity, productivity viz-a-viz financial efficiency of their companies, as well as consumers, investors, Financial manager and workers for talking decision related to their own regards of interest.

Period of the Study:

The study of interpretation and analysis of liquidity, productivity **viz-à-viz** Financial efficiency is made for the period of six years from accounting year 1997-98 to 2002-003.Researcher has been selected the base year 1997-98.This year is normal for the purpose of analysis and evaluation.

DATA COLLECTION AND DATA ANALYSIS:

"Research is a process of a systematic and in-depth study or search of any particular topic, subject or area of investigation, backed by the collection, compilation, presentation and interpretation of relevant details or data. It is a careful search or inquiry into any subject or subject matter, which is an endeavour to discover or find out valuable facts, which would be useful for further application or utilization"[3] researche and analysis of management problems would result in certain conclusions by means of logical analysis.

For the purpose of analysis of financial attributes and productivity of selected companies of Birla Group of companies, the secondary data are used. As definition point of view "the term secondary data refers to the stastical material which is not originated by investigator him self but which he obtains from some one' s records"**4** Secondary data, which were not gathered specially to meet the needs of the problem at hand. For the study data have been collected for the period six years from 1997-98 to 2002-03 of the accounting year from published annual Reports of their registered offices or stock exchanges by visiting personally or by post. Various publication have been of Birla Group of Companies collected from their corporate offices of respective

companies and other publications have also been used such as stock exchange official directory, Economics times, Financial express, R.B.I. Bulletin, Other periodicals. Joournals, autobiography of G.D.Birla, B.M.Birla and B.K.Birla. Kothari' a industrial directory of India.

Personal interviewing of the additional director, Chairmen, Directors, Joint president, Company secretary, chief accountant, General Manager Finance, Executives Joint technical advisory (planning), and assistant Director Technical) have conducted to collect some keynote information of the Companies and Birla Group of industry.

The figure contained in the annual reports and accounts have been rounded off to crores up to two decimal places. All the collected data have been presented and formulating in the form of condensed balance sheet and income statement. All the ratios and mentioned statement have been analyzed and interpreted.

As conclusion point of view interfirm comparision has been made for analysis of performance of selected companie. Various techniques of analysis e.g. Ratio analysis, Trend analysis, Regression, Graphs, Means, Diagrams.Percentagand simple average Methods have used for the presentation and interpretation of the data and at the end on basis of the conclusion, some suggestion have been made for development of performance.

(I) Tools for analysis

For the present study following tools have been used for analysis of performance of Birla group of Companies.

(1) Concept of Variable:

The variable used in the present study is (i) out put (ii) input both are as under**:**

(i) OUTPUT:

It is an important variable. It may be presented in physical units or in monetary values. Generally output is measured with the help of an index of

physical production. Under certain circumstances, the use of sales in property weighted physical units in lieu of production is also found. In addition, sometimes. Physical capacity is taken to measure output. According to prasad N.K. "the output consists, it may be measured in term of sales values of quantity or both. Monetory sales value is however, not true measure of output because due to the varying profit margins and marketing costs, it fluctuates from period to period and hence is not comparable. Quantitative data volume or number of units are better measures of output but where varieties of products are manufactured and the product mix and types, specifications and qualities of the products are liable to change from time, data are rendered un comparable. The commonly adopted method is to take both sales values and quantity adopted method is to take both sales values and quantity into account for measuring output"[5] in the present study both sales revenue and quantity have been taken in to account for measuring the output and units of outputs.

(ii) Input:

Input comprises of a number of diverse factors, It is not possible to have a common physical unit for measurement of all these factorslabour, material, overheads, fuel, and power. These factors constitute the main inputs of an industry.

(2) Ratio Analysis:

Ratio is well known and most widely tool of financial analysis can be defined as "the indicated quotient of two mathematical expression." as operation definition or ratio is the relationship between one item to another in a simple mathematical form." a ratio is simply one number expressed interims of anther. It is found by dividing one number the base into the other"[6]

"Generally there are two methods of expressing relationship in ratios"[7] (i) The percentage method like 100 percent etc. "Analysis use ratio to connecting different parts of the financial statements in a to find clues about the status of particular aspects of the business"[8] (ii) The Phrase method such as one and half to one and two for one. Ratio is useful analysis for financial

statement. It is conveniently and clearly capsulize the data in a form that is easily understood interpreted as "ratio are simply a means of highlighting in arithmetical terms, the relationship between figures drawn from financial statements"[9] The technique of ratio analysis is the process of determining and interpreting numerical relationship based on the financial statements

According to Batty "accounting ratio describe the significant relationship which exist between figures shown in a Balance sheet, in a profit and loss account, in a budgetary control system or another part of accounting organization"[10]

It concludes whether the financial condition of a business enterprise is good or bad it is universally used for appraising the performance of a business firm.

(3) TREND ANALYSIS:

The ratio analysis gives a reasonable good picture but it is incomplete in on important respect-It ignores the time dimension. The radios are snapshots of the picture at one point in time but there may be trends in motion that are in the process of rapidly eroding a relatively good present position"[11]Trend analysis is tool of analysis the financial statement in more simplified form over a period of years, "Trend analysis is horizontal analysis of financial statements often called as ' pyramid method' of ratio analysis-a guide to yearly changes."[12]

In the wards "one of the most useful forms of horizontal analysis is trend analysis. It is especially helpful in revealing proportionate change over time in selected financial data"[13] Trend analysis makes it easy to understand the changes in an item over a period of time and to draw conclusions regarding the changes in data. For analyzing the trend of data depicts in the financial statements it is necessary to have statements for a number of years. This method involves the interpretation of the percentage relationship that each statement item, bears to the same item in the ' base year.'

(II) Stastistical Tools

Statisitcal tools are utilized for data analysis and interpretation of the firm. A brief outline of the various statistical techniques being used for present study those are:

(1) CHI-SQUARE TEST:

The Chi-square test (x^2) is one of the widely used non-parametric tests among the several tests of significant developed by statisticians. Chi-square pronounced as Ki-Square.According to Ullman Neil R"Chi-square as a non parametric test it can be used to determine if categorical data shows dependency or the two classifications are independent. It can be also be used to make comparisons between theoretical populations and actual data when categories are used"[14] the formula used for calculation of chi-square is as following [15]

$$\textbf{CHI-SQUARE } (X^2) = \sum \frac{(O-E)^2}{E}$$

Where ' O' denotes the observed values and ' E' refers to the expected values. The expected value will be calculated with the help of Regression analysis and time series analysis. Chi-square distribution and critical values of Chi-square are obtained from the tables of Chi-Square disribution. The expected values will be determined with the help of assumption where the data come from the hypothesized distribution. The Chi-Square distribution is a continuous probably distribution which has the value zero at its lower limit and extraction.

(2) KRUSHAL WALLIS ONE-WAY ANALYSIS OF VARIANCE TEST:

Stevenson W.J.States, "It is a one way analysis of variance test that employs ranks rather than actual measurement, and its assumptions concerning the data are relative weak[16] the calculations are accomplished by converting each observation to rank. While ranking the observations, all the

values are treated as if they belong to one sample the ranks are given from the lowest number to the highest number. As such the lowest number is ranked as 1, The next lowest as 2 and so on until all observations have been ranked if there happens to be case of tie, that is resolved by giving them the average values of ranks"[17] The sum of rank in each sample size, and the total number of observations are used to compute the statistic (H) [18]

$$H = \frac{12}{N\ (N+1)} \left(\frac{(Rj)^2}{Ni} \right) - 3\ (N+1) \qquad E = I^{k}_{j}$$

Where

N = TOTAL NUMBER OF OBSERVATIONS
K = TOTAL NUMBER OF SAMPLES.
Hj = THE NUMBER OF OBSERVATION IN THE Jth SAMPLE
Rj = THE SUN OF RANKS IN JTH SAMPLE

(3) INDEX NUMBERS

"Index number as a number which is used to measure the level of a given phenomenon as compared to the level of the same phenomenon at same standard date"[19] Index numbers nothing more than a relative number, or a relative which expresses the relationship between two figures, where one of the figures is used as a base present study indices of sales, production and capacity utilization of selected Birla group of companies have been found out by taking 1997-98 as the base year and indices of the rest years have been calculated.

(4) ARITHMETIC MEAN

It is called as the average of difference of the values of items from some average of the series. According to Gulerian "the most commonly used average is the arithmetic mean, briefly referred to as the mean"[20] the mean has

been found by adding all the variables and dividing it by the total number of years taken.

(5) STANDARD DEVIATION

Standard deviation may be defined as positive square root of the variance. While the variance of a sample is the average square deviation of values from the mean [21]

(6) CO-EFFICIENT OF VARIATION:

Co-efficient of variation has been defined as the percentage of the standard deviation to the mean. It should be noted that higher the variability the greater would be the co-efficient of variation. Therefore, it may be pointed out that for the stability of results, Co-efficient of variation must be low. Co-efficient of variation (C.V.) may be calculated with the help of standard deviation and mean [22]

$$\text{CO-EFFICIENT OF VARIATION} = \frac{\text{STANDARD DEVIATION}}{\text{ARITHMETIC MEAN}} \times 100$$

CHAPTER PLAN:

The present study is divided into nine chapters, which are as under:

CHAPTER–1

CONCEPTUAL FRAMEWORK OF LIQUIDITY, PRODUCTIVITY, PROFITABILITY AND FIANANCIAL EFFICIENCY

The chapter includes introduction and concept of financial analysis – liquidity – productivity – profitability - activity and financial structure. Significance – different techniques of analysis –

(1) Ratio analysis -classification of ratio–Liquidity ratios- productivity ratio-financial efficiency ratio-activity ratio and structure ratio.

(2) Trend analysis

(3) Comparative analysis

(4) Fund flow analysis and

(5) Other techniques.

CHAPTER–2

PROFILE OF BIRLA GROUP OF COMPANIES

This chapter deals with profile of industrialasation like textiles and woolen, cement, automation, engineering, tea, chemicals and paper. -Brief history of Birla group, which covers the background of the Birla family-contribution to the national economy and to the society -New family, set up-Introduction of the selected units of the Birla group.

CHAPETR – 3

RESEARCH METHODOLOGY

The fourth chapter describes problem identification, survey of the existing literature problems of the study, objective and scope, hypothesis and Data collection and data ananlysis. Tools and techniques of study of liquidity, productivity and financial efficiency analysis provide information such as application of financial tools, Statistical tools and costing tools. Limitation of the study besides outline of chapter plan has been drawn.

CHAPTER- 4

ANALYSIS OF LIQUIDITY

This chapter includes the concept of liquidity, working capital importance and interpretation of working capital performance/liquidity through the ratio (1) current ratio (2) liquidity ratio (3) inventory to working capital ratio (4) working capital turnover ratio (5) debtor turnover ratio and (6) average collection period and kruskal Wallis one-way analysis of variance test. Conclusion proceeds at the end of the chapter

CHAPTER – 5

PRODUCTIVITY ANALYSIS

The chapter shows the conceptual framework of productivity, relationship of production and productivity, Relationship with efficiency, partial productivity and overall productivity. While productivity accounting contained material, labour, overheads as well as overall productivity and Conclusion.

CHAPTER – 6

ANALYSIS OF FINANCIAL EFFICIENCY

This chapter describe the concept of financial efficiernccy, profitability, difference between profit and profitability, measurement tools such as gross profit ratio, operating profit ratio, net profit ratio, return on gross capital employed, Return on net capital employed, Return on net worth and earning per share. Kruskal Wallis one-way analysis of variance test used with conclusion of the chapter.

CHAPTER – 7

ANALYSIS OF ACTIVITY

This chapter deals with concept of activity, Activity in relation to total resources- calculation of activity ratio – total assets turnover ratio – Fixed assets turnover ratio-capital turnover ratio – current assets turnover - conclusion

CHAPTER – 8

ANALYSIS OF FINANCIAL STRUCTURE

The chapter covers concepts of financial structure- analysis of assets and capital structure- analysis of long-term funds- analysis of various capital structure ratios.

CHAPTER 9

SUMMERY, FINDINGS AND SUGGESTIONS

Chapter wise general criteria, summery, finding and suggestions of the study have been presented for improvement and future development plans of Birla group of companies. It is the last chapter of given research work and conclusion led towards the end of the chapter.

LIMITATION OF THE STUDY:

1. This study is base on secondary data taken from published annual reports of selected Birla group of companies.
2. There are deferent approaches to measure the liquidity productivity and financial efficiency in this regard expert views differ from one –other.
3. The different views have been applied in the calculation of different ratios.
4. The present study is largely based on ratio analysis. It has its own limitations.

References:

1. MICHAEL V.P. "Research methodology in management" Himalayan Publishing house, Bombay, 1985,p.No.107
2. BRADLEY J.V. "Distribution free statistical tests. "Prentice Hall Inc. New Jersey, p.129
3. Ibidem, P.No. 2
4. BOOT JOHN C.G.AND COX EDWIN B. "statistical analysis for managerial decisions"2nd Edition, Tata McGraw Hill publishing Co., New Delhi, 1979, P.No.7.
5. PRASAD. N.K. "Cost accounting" Book Syndicate pvt. Ltd.Calcutta 1981,P.20
6. ANTHONY ROBERT R. "Management accounting-Tex and cases"Richrd D.Irwin inc.illinois, 1964.p.297
7. SHARMA R.P. "Corporate financial structure"printwell publishers, Jaipur-302004, p.6
8. PERSON HUNT, WILLIAMS M. CHARLES AND DONALDSON GORDON "Basic Business Finance-Tex and cases, Richad D.Irwin inc.illonois, 1966, p.141.

9. POWAL L.S. AND KUMAR VINOD "Financial statements analysis and prediction of future of return: A case study of engineering industry", Charted accountant, 11th May 198,P.988
10. BATTYJ."MANAGEMENT CCOUNTACY"Orient longmens, New Delhi, 1966, P.394.
11. WESTON J. FRED AND BRIGHAM EUGENE F. "Essentials of managerial finance"Holt, Rinehart and Winston Inc. New York, 1968,p.No.49
12. VERMA B.H."Analysis of financiastetement"Arihantpublishers, Jaipur, 1988,p.No.54
13. WALGENBACH PAUL H., DITTRICH, NORMAN E AND HANSON, EARNEST I, "Accounting and introduction, Harcourt brace Jovanovich Inc, New York, 1973,p.455
14. ULLMAN NEIL R "Elementary statistics-an applied approach"p.234, cited in Kothari C.R."Research Methodology-Methods and Techniques"Wishwa prakashan, New Delhi, 1997, p.277.
15. STEVENSON W.J. "Business statistics" Harper and Row, New York, 1978.p.299
16. STEVENSON W.J.Op.Cit.P.No.229
17. STEVENSON W.J.Op.Cit.P.No.335
18. BRADLEY J.V Op.Cit.P.No.335-36
19. KOTHARI C.R. "Research Methodology –"Methods and techniques" Wishwa Prakashan, New Delhi, 1997,p.18
20. GULERIAN R.C "stastistic for decision making" W.B. Saunders Company, Philadelphia, P.29-30.
21. STEVENSON W.J.Op.Cit.P.p. -30-30.
22. G ULERIAN R.C op.cit.P.P 29. -30.

CHAPTER – 4
ANALYSIS OF LIQUIDITY

Concept of Liquidity:

The concept of liquidity within a business is important to understand the financial management, as it is the basic criteria to test the short-term liquidity position of the enterprise. Liquidity may be defined as the ability to realize value in money the real liquid asset. It has two dimensions **(a)** The time required to convert the assets money and **(b)** The certainty of the realizable price.

Generally, liquidity means conversion of assets in to cash during normal courses of business and to have regular uninterrupted flow of cash to meet outside current liability (Generally maturing within a year) as and when due and payable and also the ensure money for day to day business operations. Hence the flow of current should circulate with such a rapid speed that they are converted in to cash within a year so that timely payment may be made to outsiders for interest dividend etc. if a major part of current assets are blocked in inventories and credit sales, not only ready cash will be available to pay current dept but there is a risk shrinkage in the total current assets available because of possible fall in the value of inventories or possible losses an account of bad depts.

The quality of current assets is therefore very important for analyzing liquidity. To know the liquidity position working capital analysis must be done.

Concept of Working Capital:

"The working capital of a business enterprise can be said to be that portion of its total financial resources which is put to a variable operative purpose."[1] There are two concepts or classifications. Viz. "Gross" and "net" where " the gross working capital is the total of all the current assets or that

amount of funds invested in current assets that are employed in the business process."[2]

"It is also known as quantitative concepts."[3] Gross working capital refers to business point of view. While "net working capital is the difference between current assets and current liabilities."[4] "It is also known as qualitative concepts."[5] Net working capital refers to accounting point of view. Both of Concepts of working capital have their own importance. "The gross working capital is the sum of all such assets as are required to be converted into cash during a short operating cycle of one year while net working capital is the excess of current assets over current liabilities."[6]

Professor Husband and rockery explained the usefulness of quantitative concepts of working capital as "despite the uncertainty of quantitative concepts of working capital it provides a more objective basis of determining the type and amount of finance" [7] "The gross working capital concept embassies the use and the net concept the sources." [8] "The integration of both these concepts is necessary in order to understand working capital management from the point of view of risk, Return and uncertainty."[9] "Thus above both of concepts of working capital have their own uses and merits"

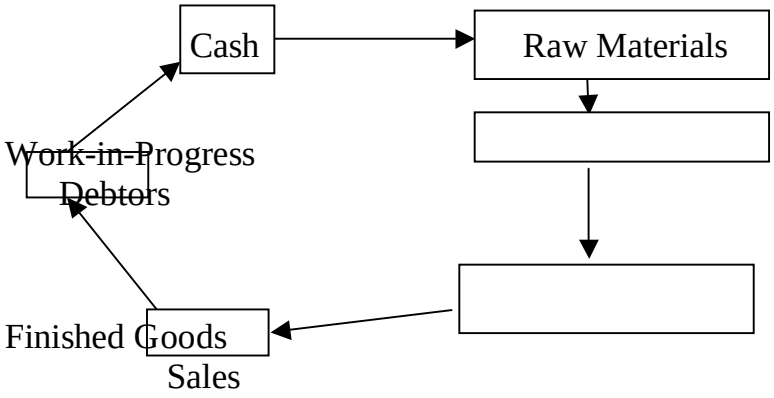
The choice of the particular concept will depend upon the purpose in view of the two concepts the net is more useful, if the purpose is to find out the financial position of an enterprise."[10]

Importance of Working Capital:

Analysis of working capital performance has importance, both of way internal and external because it has close relationship with the current or day-to-day operation of business organization "Management to pay particular attention to the planning & control of working capital." [11] R.D.Kennedy and S.Y.Mcmuller stated, "In –adequacy as mismanagement of working capital is the leading cause of business failures." [12] Working capital is the alternative measure of the changes in the financial position. Which is concerned with "the safeguarding and controlling of the firms current assets and the planning for

sufficient funds to current bills?" [13] According to Guthaman "just as circulation of blood is very necessary in the human body to maintain life, working capital is very necessary to maintain the business. Therefore, working capital is the life blood and controlling nerve center of the business." [14] "An enterprise can not be run without appropriate working capital. Not only working capital is enough, but also there should be a proper management of working capital because it is very important for the success of an enterprise and for maximizing the value." [15] Working capital is essential element for business organization but the quantum of its requirement is different from enterprise to enterprise. "The goal of working capital is to manage each of the firm' s current assets and current liabilities in such a way that an acceptable level of net working capital is maintained."[16] It is concerned with the choice of the financing mix for raising the current resources In the business there is operating cycle, which converts cash into raw materials, raw material in to goods in process, further goods. Finished goods, debtors, credit sales and debtors in to cash the cycle of above operations shown in diagram No.-4.1.

Diagram No.-4.1.
Conversion of operating cycle



Above diagram shows a business organization requires working capital due to its production, sales, cash payments, according Walker and Banghan "The smoother and more rapid the flow of funds, the more efficient is each dollar of working capital. In other words when the flow of working capital is

smooth and rapid the amount of working capital required to produce a given output is less than when interruptions occur which cause the flow to slow down" [17] In a dynamic economy the perfect synchronization with zero working capital is impossible and there for management should attempts to maintain an adequate level of working capital at all times. Brown and Howard described that "Though the current liabilities are paid from cash generated by the current assets as a whole the working capital should be sufficient in relation to the current

Assets provide against danger from shrinkage in the value of current assets particularly inventories." [18] proper management of working capital must ensure the adequate amount of working capital as per needs of business organization. It should be in good health and circulated efficiency.

Thus, policies regarding working capital have a great influence on an enterprise' s profitability, liquidity and structural construction because of management of working capital is to ensure its optimum utilization for overall profitability of an enterprise.

According to Professor N.M knandewal "working capital has also a technical role to play in the maximization of the rate of return. The units must keep pace with the scientific and technological taking place in the field to which it pertains." [19] Therefore a financial manager should aware about appropriate management of working capital policies by the each of the components of working capital so as to ensure about adequate profitability and proper liquidity structure.

Analysis of Liquidity Position Through Working Capital Ratio:

With a view to appraising the performance in utilization of working capital by the Birla Group and the individual companies under study, the analysis of working capital has been made from the point of view of:

1. Short term creditors:
2. Efficiency in the use of working capital:
3. Investment in working capital:

4. The collection policy of debts

Short term creditors are primarily concerned with the analysis of short term financial position or test of liquidity, Which is valuable to management in checking the efficiency with which working capital is being employed in the business. The problems posed in connection

With the ratio analysis of the short-term financial position are (1) will the company be also to its current depts. promptly? (2) Is management utilizing the capital position effectively? (3) Is the current financial position improving? The following ratios have been calculated to evaluate the performance of working capital:

1. Current ratio:
2. Quick ratio:
3. Working capital turnover:
4. Inventory to working capital ratio:
5. Debtors turnover: and:
6. Average collection period:

(1) Current Ratio:-

Current ratio is used to measure the liquidity position of the concerned and thus it reflects the short-term solvency of the concerned. It explains the relationship between the current assets and current liabilities. It gives a general picture of the adequacy of the working capital of the concern and the concern' s ability to meet its day-to-day payment obligations. The current ratio is calculated by dividing current liabilities:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

This ratio indicates the availability of current assets in rupees for every one rupee of current liabilities. A ratio of greater then one means that concern has more current assets than current liabilities .A conventional rule, current

ratio of 2:1 or more considered to be satisfactory. Tondon committee has recommended that idea current ratio for bank financing is 1.33:1

A relatively high value of the current ratio is considered as a indication that the firm is not lacking in liquidity of its assets and has the ability to pay its current liabilities on the other hand, a relatively low value of current ratio is considered as on indication that the firm faces difficulty in paying its current obligations. In Nut shell, higher the current ratio, the greater the margin of safety, i.e., a cushion of protection for creditors and large the amount of current assets in relation to current liabilities, more the firm' s ability to meet its current obligations. However, too high ratio may be favorable to creditors, but is not beneficial for the firms, because it shows poor utilization of its current assets.

Table No.-4.1
Current Ratio of selected units of Birla Group of Companies (From 1997-98 to 2002-03) (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2 001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.51	1.349	1.245	1.211	1.111	1.021	**1.24**
MYSORE CEMENT LTD.	1.164	0.989	0.742	0.859	0.753	0.592	**0.85**
SHREE DIG.CEMENT LTD	1.209	0.757	0.695	0.488	0.432	0.337	**0.653**
BIRLA CORPORATIO LTD.	1.395	1.038	0.999	1.108	1.417	1.297	**1.209**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.43	1.235	1.11	1.115	0.988	0.948	**1.14**
KESORAM IND. &CO.MILLS.	1.563	1.59	1.533	1.644	1.212	1.115	**1.44**
INDIA RAYON & IND.	3.1	4.7	3.6	3.5	2.98	2.61	**3.42**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.468	1.182	1.257	1.19	1.11	1.137	**1.224**
HINDALCO IND. LTD.	3.723	3.78	5.697	4.2	3.569	2.1	**3.84**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.998	1.098	0.873	0.943	1.657	1.544	**1.19**
BIRLA POWER & SOL LTD.	2.83	1.908	2.043	1.836	1.378	1.516	**1.92**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.382	1.054	1.442	2.255	1.923	1.56	**1.6**
TEA INDUSTY							
JAYSHREE TEA & IND.	2.827	3.301	2.012	1.886	2.69	2.099	**2.47**
AGRO INDUSTRY							
ZUARI INDUSTIES LTD.	1.909	1.463	1.253	1.327	1.207	1.063	**1.37**
PAPER INDUSTRY							
ORIENT PAPER LTD.	1.398	1.172	1.281	1.248	1.239	1.107	**1.24**
DIVERSIFIED INDUSRY							

GRASIM IND. LTD.	3.5	2.5	2.2	2.1	1.88	1.69	**2.31**
BIRLA GROUP	**1.962**	**1.819**	**1.7488**	**1.681**	**1.596**	**1.359**	**1.695**

Sources: computed from the Annual Reports & A/C' s of Birla Group of Co.' s

The current ratio of selected units of Birla Group of Companies has been presented in the table No.- 4.1. The ratio of Birla group showed declined trend during the study period with an average of 1.695 times. The ratio varied from the lower of 1.359 times in 2002-03 to the higher of 1.962 times in 1997-98. In most of the years the ratio had not followed the standard of 2:1.

In Hyderabad cement ltd. the current ratio ranged between 1.02 times in 2002-03 and 1.51 times in 1997-98 with an average of 1.24 times. The ratio showed fluctuated trend however the company had not maintained the standard ratio 2:1 times in whole years of study period. The ratio considered satisfactory to meet current liabilities.

In Mysore Cement Ltd. the current ratio showed decreased trend during the study period. The highest ratio was 1.164 times in 1997-98 and the lowest ratio was 0.592 times in 2002-03. The company was not able to meet current liabilities except in 1997-98. The company had not maintained the standard of 2:1. The average ratio also had been 0.85 times which was below the standard.

In Shree Digvijay Cement Ltd. the current ratio showed decreased trend. It did not maintain the standard. The ratio varied from 0.337 times in 2002-03 to 1.209 times in1997-98with an average of 0.653 times. After first years had the not been able to meet the current liabilities.

During the study period of time the current ratio of Birla Corporation ltd. had been below the standard norms. It varied from 1.395 times in 1997-98 to 1.297 times in 2002-03. After the first years the ratio showed declined trend up to 2000-01. In 2001-02 the ratio was slightly changed to 1.417 times which was the highest ratio in whole years of research period.

In Century textiles the current ratio was also below the standard norms. In 1997-98 it was 1.43 times. It varied from 0.948 times in 2002-03 to 1.43 times in 1997-98.The ratio showed fluctuated trend in most of the years. In the

last two years the company had not been to the current liabilities. The average ratio was 1.14 times.

Table No.-4.1 showed current ratio of Kesoram mills ltd. The ratio ranged between 1.115 times in 2002-03 and 1.644 times in 2000-01. In 1997-98 the ratio was 1.563 times. It decreased in the last two years. It increased 1.59 times in 1998-99 with an average of 1.44 times. The company had not maintained the standard of 2:1

In Indian Rayon ltd. the current ratio ranged between 2.61 times in 2002-03 and 4.7 times in 1998-99. In 1997-98 the ratio was 3.1 times and in 1999-2000. The ratio was 3.6 times. The average ratio was 3.42 times and the trend was decreasing throughout the years.

The Hindustan Motors ltd. showed the current ratio on an average of 1.224 times varied from 1.118 times in 1998-99 to 1.468 times in 1997-98. The trend was slightly fluctuated. In most of the years the ratio was not above standard of 2:1.

The current ratio of Hinadalco ltd. had been highest 5.69 times in 1999-2000 to 2.1 times in 2002-03 with an average of 3.84 times. The trend had been fluctuated. The Ratio was not above the standard throughout the years. Average ratio was above the combined average of Birla group of companies.

In Texmaco ltd. the current ratio had been on an average of 1.19 times ranging from 0.873 times in 1999-2000 to 1.657 times in 2001-02. The ratio showed the trend fluctuated. In 1997-98, 1999-2000, 2000-01 the company had not maintained the standard ratio of 2:1. Average ratio was below the combined average of Birla group of companies.

The Birla power & solution ltd. showed the current ratio which varied from 1.378 times in 2001-02 to 2.83 times with an average of 1.92 times. Average ratio was below the combined average of Birla group of companies. The trend was fluctuated .In most of years the ratio was below the standard. The liquidity position had been good.

The Birla V.X.L. ltd. showed the current ratio, which ranged between 1.054 times in 1998-99 to 2.255 times in 2000-01. The average ratio was 1.6 times which showed the liquidity position had been good. The company was able to meet the current liabilities. Average ratio was below the combined average of Birla group of companies.

In Jay Shree tea & Ind. the ratio was above the standard in first three years. The highest ratio was 3.301 times in 1998-99 to 1.886 times in 2000-01 with an average of 2.47 times. Average ratio was above the combined average of Birla group of companies. The ratio indicated the slightly fluctuated. However the company maintained the standard norms of 2:1.

The Zuari Ltd. indicated the current ratio fluctuated from highest 1.46 times in 1998-99 to 1.063 times in 2002-03 times with an average of 1.37 times showing the fluctuated trend. Average ratio was below the combined average of Birla group of companies. The company had not maintained the standard of 2:1.

The orient paper ltd.showed the current ratio, which range between 1.107 times in 2002-03 to 1.398 times in 1997-98 with an average of 1.24 times. The trend had been mix fluctuating during the study period of time.

In Grasim ind. ltd. the ratio had been on an average of 2.31 times ranging from 1.69 times in 2002-03 to 3.5 times in 1997-98. From 1997-98 to 2002-03 the ratio showed the decreased trend. Average ratio was above the combined average of Birla group of companies.

On the whole the Hindalco ltd., Grasim ltd, Indian Rayon & ind. Jayshree tea & ind. ltd., and Birla V.X.L. ltd have maintained the standard norms of 2:1. Other selected units had not maintained the standard norms but except Mysor cement and Shree digvijay cement ltd. had the ability to pay the current liabilities.

Current ratio of Birla group of companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between current ratio of Birla group of companies

Alternative Hypothesis: There is significant difference between current ratio of Birla group of companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-4.1.1

COMPARATIVE CURRENT RATIO OF BIRLA GROUP OF COMPANIES WITH KRUSKAL WALLIS ONE-WAY ANALYASIS OF VARINCE

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	1.51	57	1.164	30	1.2	35	1.395	50	1.43	53	1.563	62	3.1	86	1.468	56
1998-99	1.349	45	0.989	14	0.8	8	1.038	18	1.235	38	1.59	63	4.7	95	1.182	32
1999-00	1.245	40	0.742	6	0.7	5	0.999	16	1.11	24.5	1.533	59	3.6	91	1.257	42
2000-01	1.211	36	0.859	9	0.5	3	1.108	23	1.115	27.5	1.644	64	3.5	88.5	1.19	33
2001-02	1.111	26	0.753	7	0.4	2	1.417	52	0.988	13	1.212	37	2.98	85	1.11	25
2002-03	1.021	17	0.592	4	0.3	1	1.297	45	0.948	12	1.115	27.5	2.61	81	1.137	29
Total Rank		**221**		**70**		**54**		**204**		**168**		**313**		**527**		**217**

HIND	R9	TAX	R10	BPS	R11	BV.X.L	R12	J.TEA	R13	ZRY	R14	OPR	R15	GRM	R16
3.723	92	0.998	15	2.8	84	1.382	49	2.827	83	1.909	71	1.398	51	3.5	89
3.78	93	1.098	21	1.9	70	1.054	19	3.301	87	1.463	55	1.172	31	2.5	80
5.697	96	0.873	10	2	74	1.442	54	2.012	73	1.253	42	1.281	44	2.2	78
4.2	94	0.943	11	1.8	67	2.255	79	1.886	69	1.327	46	1.248	41	2.1	77
3.569	90	1.657	65	1.4	48	1.923	72	2.69	82	1.207	34	1.239	39	1.88	68
2.1	76.5	1.544	60	1.5	58	1.56	61	2.099	75	1.063	20	1.107	22	1.69	66
	541.5		**182**		**401**		**334**		**469**		**268**		**228**		**458**

$$H = \frac{12}{N(N+1)} \qquad E = \frac{I}{j} \frac{(Rj)}{Ni} - 3(N+1)$$

$$K = \frac{12}{96(96+1)} \left\{ \frac{(221)^2}{6} + \frac{(70)^2}{6} + \frac{(54)^2}{6} + \frac{(204)^2}{6} + \frac{(168)^2}{6} \right.$$

$$\left. \frac{(313)^2}{} + \frac{(527)^2}{} + \frac{(217)^2}{} + \frac{(541.5)^2}{} + \frac{(182)^2}{} \right.$$

$$\frac{(401)^2}{6} + \frac{(334)^2}{6} + \frac{(469)^2}{6} + \frac{(268)^2}{6} + \frac{(228)^2}{6} + \frac{(458)^2}{6} \Big] - 3(96+1)$$

$$= 0.00128865 \quad (283334.375) - 291$$

$$= 365.12 - 291$$

$$= 74.12$$

On the basis of above table the calculated value of H works out at 74.12, being more than the critical value of 24.996. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Rejection of the null hypothesis and the acceptance of alternative hypothesis reveal that there has been significance different between the current ratio Birla group of companies. It may also lead to the conclusion that the current ratio differs from plant to plant.

(2) Acid Test Ratio or Quick Ratio:

Though, the current ratio is the measurement of shor-term financial solvency. But it does not measure the quality of current assets. Thus an additional analysis of the quality of current assets may be investigated by Acid Test or quick ratio.

The quick ratio also named as liquid ratio for the acid test ratio and is found out by dividing quick assets i.e. Current assets minus the inventories by quick liabilities. It is in a way a refined form of the current ratio and a favorable acid test ratio will mean very sound cash position of the business to which it relates. Comparison between current ratio and quick ratio indicates current ratio is the measurement of short-term financial solvency last it does not measure the quality of current assets while quick ratio does it. The formula for that is following.

$$\text{Quick ratio} = \frac{\text{Current assets- inventories}}{\text{Quick liabilities}}$$

Current liabilities

In inventories and prepaid expenses are excluded forms this computation because they might not readily convertible in to cash. The creditors are interested particularly in this ratio since it relates to the ' pool' of cash and immediately cash inflow to immediate cash outflows. Generally an acid test ratio 1:1 is considered satisfactory as a firm can easily meet all current claims.

Table No.-4.2
The Acid-Test Ratio of Birla Group of Companies
(From 1997-98 to 2002-03) (In times)

COMPANY	1997-98	1998-99	1999-20	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	0.51	0.33	0.27	0.18	0.28	0.28	**0.308**
MYSORE CEMENT LTD.	0.22	0.22	0.16	0.3	0.24	0.13	**0.211**
SHREE DIG.CEMENT LTD	0.41	0.16	0.23	0.11	0.1	0.08	**0.181**
BIRLA CORPORATIO LTD.	0.47	0.3	0.22	0.42	0.58	0.6	**0.431**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	0.48	0.39	0.4	0.45	0.36	0.31	**0.398**
KESORAM IND. &CO.MILLS.	0.62	0.64	0.75	0.66	0.49	0.39	**0.591**
NDIA RAYON & IND.	2.02	3.26	2.27	2.04	1.23	0.96	**1.963**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	0.53	0.38	0.42	0.38	0.42	0.35	**0.413**
HINDALCO IND. LTD.	1.84	1.99	3.56	2.15	2.02	0.84	**2.066**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.12	0.17	0.14	0.23	0.83	0.67	**0.36**
BIRLA POWER & SOL LTD.	1.38	0.87	0.82	0.51	0.5	0.46	**0.756**
WOOL INDUSTRY							
BIRLA VXL. LTD.	0.44	0.24	0.26	0.51	0.52	0.53	**0.416**
TEA INDUSTY							
JAYSHREE TEA & IND.	1.36	1.33	0.54	0.8	1.46	1.3	**1.131**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	0.23	0.31	0.33	0.35	0.41	0.35	**0.33**
PAPER INDUSTRY							
ORIENT PAPER LTD.	0.65	0.54	0.67	0.54	0.57	0.52	**0.581**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	2.12	1.54	1.4	1.29	1.22	1.17	**1.456**
BIRLA GROUP	**0.837**	**0.792**	**0.778**	**0.682**	**0.701**	**0.559**	**0.725**

Sources: computed from annual reports from 1997-98 to 2002-03

The Acid-Test Ratio of the Birla Group of Companies in India taking all sixteen units under study together and of the individual companies under study has been shown in table No.-4.2.

The Table No.-4.2 showed Quick Ratio of Birla Group of Companies with declined trend through out the research period. The ratio varied from 0.559 times in 2002-03 to 0.837 times in 1997-98 with an average of 0.725 times.

The table no.-4.2 showed the quick ratio of Hyderabad Cement Ltd. The ratio in Hyderabad Cement Ltd. fluctuated from 0.51 times in 1997-98 to 0.28 times in 2002-03 and decreased up to 2000-01 and increased the in the last two years. Earlier the ratio was below the norm. On the whole the liquidity position was satisfactory and the company is well advised to maintain the liquidity.

In Mysore Cement Ltd. the ratio had been 0.22 times in 1997-98 and 0.22 times in 1998-99.The highest ratio was 0.30 times in 2000-01. It the last years the ratio was very low. It registered a varying trend from 1997-98 to 2002-03 with the average of 0.21 times. The company could not maintain the norm. The company had no enough funds to pay immediately current liabilities.

The above table No.-4.2 displayed the acid test ratio of shree Digvijay. The ratio ranged between 0.08 times in 2001-02 and 0.48 times in 1997-98 with an average of 0.18 times. The acid test ratio showed declined trend throughout the study period. In most of years the company was not able to maintain the norms of 1:1. The company is advised to increase the trend.

In The Birla corporation ltd .the acid- test ratio had been an average of 0.43 times ranging between 0.22 times in 1999-2000 and 0.60 times in 2002-03. This was not able to maintain the standard norm of 1:1. The trend was increasing during the study period. The company should increase the current assets.

The Century Textiles showed fluctuated trend whole period of study time. In 1997-98 the ratio was 0.48 times and then it was decreased to 0.39 times in 1998-99.In 1999-2000 the ratio was increased 0.40 times. For the last years it showed declined trend with average of 0.40 times. The company did not maintain the standard norms of 1:1. The company is advised to increase the trend.

Acid-test ratio in Kesoram mills had showed fluctuated trend. The ratio gives very poor picture ranging 0.39 times in 2002-03 and 0.75 times in 1999-2000 with an average of 0.56 times It can be said that the liquid position of the company was very disturbing because the fund of its current creditors were not safe as the means for repaying. The company is advised to increase the trend.

The quick ratio of Grasim Ind ltd. ranged between 1.17 times in 2002-03 and 2.12 times in 1997-98. The average ratio had been 1.46 times. The trend was decreasing during the research period. The company was able to scope with the norm of 1:1. The liquid position was good.

In Indian Rayon & ind. the acid test ratio of the company marked a fluctuating trend and varied from 0.96 times in 2002-03 to 3.26 times in 1998-99. On an average the acid test ratio was 1.96 times the third highest among the company under study. During 1998-99 the ratio of the company was the highest during the period and among the company under study. The reason behind it was comparatively low decrease in quick assets as compared to steep declined in current liabilities.

The acid-test ratio of Hindustan Motors ltd. registered the varying trend from 1997-98 to 2002-03. It varied from 0.35 tomes in 2002-03 to 0.53 times in 1997-98 with the average of 0.41 times. The highest ratio was in the year of 1997-98.Then after declined 0.38 times in 1998-99 and in 1999-2000.42 times. In the last three years it showed fluctuated. The company had not maintained the standard of 1:1 the liquid position was not sound.

In Hindalco ltd. the ratio had been on an average of 2.07 times varied from 0.84 times in 2002-03 to 3.56 times in 1999-2000. The company

maintained the standard ratio except in 2002-03. The trend fluctuated during the study period. The liquid position was good during the study period

In Texmaco Ltd., the acid test ratio of the marked a fluctuating trend and varied from 0.14 times in 1999-2000 to 0.83 times in 2001-02. During 2001-02 the ratio was the highest one. In starting period of three years the liquidity ratio showed decreased trend. After these years the ratio lightly changed. However the standard norm had not maintained throughout the study period because of low decrease of quick assets.

In Birla power & solution ltd. the ratio had been on average of 0.76 times ranging from 0.46 times in 2002-03 to 1.38 times in 1997-98. The trend was declining through out the years. Except the first years of study period the company had not maintained the standard ratio. The company is advised to make sound liquid position.

The acid-test ratio of Birla V.X.L ltd. registered a varying trend and it varied from 0.26 times in 1999-2000 to 0.53 times in 2002-03. In most of the years the trend was fluctuated and below the standard. The average ratio was 0.42 times. The liquid position is therefore threatened and there has been a cute shortage of working capital through out the study period. Though there was some improvement in 2000-01 and 2001-02, yet during 1999-2000 the ratio was only 0.26 times.

The Jayshree tae & ind. ltd.showed a fluctuating trend from 1997-98 to 2002-03. The trend varied from 0.54 times in 1999-2000 and 1.46 times in 2001-02. In 1997-98 the ratio was 1.36 and in 1998-99 the ratio was 1.33 times. The ratio was declined to 0.54 times on 1999-2000. The average ratio was 1.13 times. In the last two years the ratio had been above the standard which showed the good liquidity position.

The Zuari Ltd. showed a quick ratio. The ratio gives a very poor picture. It was in the range of 0.23 times in 1997-98 and 0.41 times in 2001-02. The average ratio had been of 0.33, which is below the standard norm. The

trend was increasing up to 2001-02 and in the last years the ratio was progressive but it was not satisfactory.

The acid test ratio in Orient paper ltd.showed progressive mark in 1997-98 0.65 times 0.67 times in 1999-2000 and in 2001-02 0.57 times. In most of years the ratio was below the norm. The ratio ranged 0.52 times in 2002-03 and 0.67 times in 1999-2000. This showed a disappointing liquid position of the company. It is suggested that the company should improve its liquid position.

On the basis of above analysis it can be seen that the liquid position of Hinadalco ltd. Grasim ind. Indian rayon & ind. and jayshree tea & Ind. Have the average of quick ratio of the other companies held a reasonable and satisfactory position.

The Quick ratio of Birla group of companies and Kruskal Wallis One Way analysis of Variance test:

Table No.4.2.1

COMPARATIVE QUICK RATIO OF BIRLA GROUP OF COMPANIES WITH KRUSKAL WALLIS ONE-WAY ANALYASIS OF VARINCE

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	0.51	**51**	0.22	**12**	0.4	**38.5**	0.47	**46**	0.48	**47**	0.62	**63**	2.02	**90**	0.53	**56**
1998-99	0.33	**27.5**	0.22	**12**	0.2	**7.5**	0.3	**23.5**	0.39	**35.5**	0.64	**64**	3.26	**95**	0.38	**34**
1999-00	0.27	**20**	0.16	**7.5**	0.2	**14.5**	0.22	**12**	0.4	**37**	0.75	**69**	2.27	**94**	0.42	**42**
2000-01	0.18	**10**	0.3	**23.5**	0.1	**3**	0.42	**41**	0.45	**44**	0.66	**66**	2.04	**91**	0.38	**34**
2001-02	0.28	**21.5**	0.24	**17.5**	0.1	**2**	0.58	**61**	0.36	**32**	0.49	**48**	1.23	**78**	0.42	**42**
2002-03	0.28	**21.5**	0.13	**5**	0.1	**1**	0.6	**62**	0.31	**25.5**	0.39	**35.5**	0.96	**75**	0.35	**30**
Total Rank		**152**		**77.5**		**67**		**246**		**221**		**346**		**523**		**235**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	J.TEA	R13	ZRY	R14	OPR	R15	GRM	R16
1.84	**87**	0.12	**4**	1.38	**83**	0.44	**43**	1.36	**82**	0.23	**15**	0.65	**65**	2.12	92
1.99	**88**	0.17	**9**	0.87	**74**	0.24	**17.5**	1.33	**81**	0.31	**25.5**	0.54	**58**	1.54	86
3.56	**96**	0.14	**6**	0.82	**71**	0.26	**19**	0.54	**58**	0.33	**27.5**	0.67	**67.5**	1.4	84
2.15	**93**	0.23	**15**	0.51	**51**	0.51	**51.5**	0.8	**70**	0.35	**29.5**	0.54	**58**	1.29	79
2.02	**90**	0.83	**72**	0.5	**49**	0.52	**53.5**	1.46	**85**	0.41	**38.5**	0.57	**60**	1.22	77
0.84	**73**	0.67	**67.5**	0.46	**45**	0.53	**55.5**	1.3	**80**	0.35	**29.5**	0.52	**53.5**	1.17	76
	527		**174**		**373**		**240**		**456**		**166**		**362**		**494**

$$H = \frac{12}{\quad} \qquad E = \underline{I} \qquad \underline{(Rj)} \qquad -3\,(N + 1)$$

$$\frac{N(N+1)}{} \qquad \sum_{j} \frac{Ni}{}$$

Null Hypothesis: There is no significant difference between quick ratio of Birla group of companies.

Alternative Hypothesis: There is significant difference between quick ratio of Birla group of companies.

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

$$K = \frac{12}{96(96+1)} \left[\frac{(152)^2}{6} + \frac{(77.5)^2}{6} + \frac{(67)^2}{6} + \frac{(246)^2}{6} + \frac{(221)^2}{6} \right.$$

$$\left. \frac{(346)^2}{6} + \frac{(523)^2}{6} + \frac{(235)^2}{6} + \frac{(527)^2}{6} + \frac{(174)^2}{6} \right.$$

$$\left. \frac{(373)^2}{6} + \frac{(240)^2}{6} + \frac{(456)^2}{6} + \frac{(166)^2}{6} + \frac{(362)^2}{6} + \frac{(494)^2}{6} \right] - 3(96+1)$$

$$= 0.00128865 \quad (284263.792) - 291$$

$$= 366.32 - 291 \qquad = 75.31$$

The Table No.-4.2.1 shows the calculated value of H works out at 75.31, which is more than the critical value of 24.996. Hence, the rejection of the null hypothesis is based on Kruskal Wallis analysis of variance test. The acceptance of alternative hypothesis would indicate that all companies' quick ratio might not be considered equal.

(3) Inventory to Working Capital Ratio:-

Inventory to working capital ratio was showed the amount of working capital invested in inventory, where the term inventory includes raw materials. Semi finished goods and finished goods. This ratio is dividing inventory by working capital or net current assets.

Inventory

Inventory to working capital ratio = ----------

Working capital

The general accepted rules of this ratio are that inventory should not over the working capital. Around three quarters (i.e.0.75 times) of working capital generally preferred. Table No.-4.3 outlined the inventory to working capital ratio of selected companies of Birla Group under study.

Table No.-4.3 indicated that during the whole study period the inventory to working capital ratio of Birla Group of Companies which showed the fluctuated trend during study period. The ratio ranged 1.279 times in 1999-2000 to 2.876 times in 2002-03 with an average of 1.963 times.

Table No.-4.3
Inventory to working capital ratio of Birla group of companies.
From 1997-97 to 2002-03 (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.41	1.98	2.67	3.28	5.45	27.08	**6.97**
MYSORE CEMENT LTD.	3.13	0	0	0	0	0	**0.521**
SHREE DIG.CEMENT LTD	2.97	0	0	0	0	0	**0.495**
BIRLA CORPORATIO LTD.	15.15	12.94	0	3.99	1.39	1.55	**5.836**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.36	2.14	4.06	4.16	0	0	**1.95**
KESORAM IND. &CO.MILLS.	1.11	1.21	1.07	0.89	1.96	3.96	**1.7**
INDIA RAYON & IND.	0.51	0.38	0.6	0.63	0.62	0.68	**0.57**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	0.53	0.38	0.42	0.38	0.42	0.35	**0.413**
HINDALCO IND. LTD.	1.84	1.99	3.56	2.15	2.02	0.84	**2.066**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0	5.29	0	0	0.72	0.91	**1.16**
BIRLA POWER & SOL LTD.	0.4	0.5	0.51	0.55	0.64	0.84	**0.58**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.7	11.25	1.89	0.93	1.14	1.31	**3.04**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.55	0.56	0.74	0.66	0.46	0.47	**0.57**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.19	1.49	2.81	1.57	2.36	4.62	**2.34**
PAPER INDUSTRY							
ORIENT PAPER LTD.	1.2	2.1	1.48	2.09	2	3.74	**2.1**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.55	0.65	0.66	0.73	0.75	0.61	**0.66**
BIRLA GROUP	**2.21**	**2.678**	**1.279**	**1.376**	**1.246**	**2.876**	**1.936**

Sources: from annual reports and accounts from 1997-98 to 2002-03

Table No.-4.3 indicated that during the whole study period the inventory to working capital ratio of Hyderabad cement ltd. Showed an average of 6.97 times which among the all selected companies followed by Birla corporation ltd.showing average ratio of 3.56 times, Hindustan motor ltd. Sowed 3.15 times, Birla V.X.L ltd. Had 3.03 times and orient paper ltd. had showed 2.10 times. In these companies the ratio was more than 2 times which showed that more than the working capital funds tied up in inventories.

In century textiles ltd.the inventory to working capital ratio on an average had been 1.95 time followed by Kesoram ltd. 1.70 times, Zuary ltd. 1.46 times and texmaco ltd. 1.16 times. These companies showed the on an average ratio more than 1 (one) which indicates that more than working capital funds tied in inventory.

Grasim cement ind. showed on an average inventory to working capital ratio 0.66 time followed by Indian rayon & ind. 0.67 times, Digvijay cement ltd 0.49 times Hindalco ltd. 0.39 times. All these companies have the on an average ratio below one rupee. The ratio in Hindalco ltd ranged 0.26 times in 1999-2000 to 0.70 times in 2002-03.The trends was increasing after first years. The ratio in Birla power & solution ltd. varied 0.40 times in 1997-98 to 0.84 times in 2002-03.

In case of Mysore Cement Ltd. and Shree Digvijay Cement Ltd. The inventory turnover ratio had been zero after first years due to in efficiency of management. Remains all other companies' ratio showed average above one in the case of inventory to capital ratio as well as generally with fluctuated and mix trend.

Inventory to working capital of Birla group of companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between inventories to working capital of Birla group of companies

Alternative Hypothesis: There is significant difference between inventories to working capital of Birla Groups of Companies.

Level of significance: 5 percent.

Statistical test used: Krukal Wallis one-way analysis variance test.

Critical value: 24.996

$$H = \frac{12}{N(N+1)} \qquad E = \frac{I_j}{} \qquad \frac{k}{Ni} \qquad \frac{(Rj)^2}{} \qquad -3(N+1)$$

Where, N = n1 + n2 + n3 ..nk and **Rj = sum of the rank**

Table No.-4.3.1

COMPARATIVE INVENTORYTOWORKING CAPITAL OF BIRLA GROUP OF COMPANIES WITH KRUSKAL WALLIS ONE-WAY ANALYASIS OF VARINCE

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	1.41	**61**	3.13	**8.5**	2.97	**81**	15.15	**95**	1.36	**59**	1.11	**53**	0.51	**27.5**	0.53	**29**
1998-99	1.98	**70**	0	**8.5**	0	**8.5**	12.94	**94**	2.14	**76**	1.21	**57**	0.38	**19**	0.38	**19**
1999-00	2.67	**79**	0	**8.5**	0	**8.5**	0	**8.5**	4.06	**88**	1.07	**52**	0.6	**34**	0.42	**23**
2000-01	3.28	**83**	0	**8.5**	0	**8.5**	3.99	**87**	4.16	**89**	0.89	**49**	0.63	**37**	0.38	**19**
2001-02	5.45	**92**	0	**8.5**	0	**8.5**	1.39	**60**	0	**8.5**	1.96	**69**	0.62	**36**	0.42	**23**
2002-03	27.08	**96**	0	**8.5**	0	**8.5**	1.55	**64**	0	**8.5**	3.96	**86**	0.68	**42**	0.35	**17**
Total Rank		**481**		**51**		**124**		**409**		**329**		**366**		**196**		**130**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	J.TEA	R13	ZRY	R14	OPR	R15	GRM	R16
1.84	**62**	0	**8.5**	0.4	**21**	1.7	**66**	0.55	**31**	1.19	**55**	1.2	**56**	0.55	**31**
1.99	**71**	5.29	**91**	0.5	**26**	11.25	**93**	0.56	**33**	1.49	**63**	2.1	**75**	0.65	**39**
3.56	**84**	0	**8.5**	0.51	**27.5**	1.89	**68**	0.74	**45**	2.81	**80**	1.48	**62**	0.66	**41**
2.15	**77**	0	**8.5**	0.55	**31**	0.93	**51**	0.66	**40.5**	1.57	**65**	2.09	**74**	0.73	**44**
2.02	**73**	0.72	**43**	0.64	**38**	1.14	**54**	0.46	**24**	2.36	**78**	2	**72**	0.75	**46**
0.84	**47.5**	0.91	**50**	0.84	**47.5**	1.31	**58**	0.47	**25**	4.62	**90**	3.74	**85**	0.61	**35**
	415		**210**		**191**		**390**		**199**		**431**		**424**		**236**

$$K = \frac{12}{} \left[\frac{(481)^2}{} + \frac{(51)^2}{} + \frac{(124)^2}{} + \frac{(409)^2}{} + \frac{(329)}{} \right.$$

$$\frac{96(96+1)}{6}\left[\frac{(366)^2}{6}+\frac{(196)^2}{6}+\frac{(130)^2}{6}+\frac{(415)^2}{6}+\frac{(210)^2}{6}+\frac{(191)^2}{6}+\frac{(390)^2}{6}+\frac{(199)^2}{6}+\frac{(431)^2}{6}+\frac{(424)^2}{6}+\frac{(236)^2}{6}\right]-3(96+1)$$

$$= 0.00128865\ (263031.792) - 291$$

$$= 338.96 - 291 = 47.96$$

On the basis of above table the calculated value of H works out at 47.96, being more than the critical value of 24.996. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Rejection of the null hypothesis and the acceptance of alternative hypothesis reveal that there has been significance different between the inventories to working capital of Birla group of companies It may also lead to the conclusion that the current ratio differs from plant to plant.

(4) Working Capital Turnover Ratio:

In order to test the efficiency with which working capital is used the working capital turnover ratio is calculated. The ratio is computed by dividing the amount of sales by net working capital.

$$\text{Working capital turnover ratio} = \frac{\text{Net Sales}}{\text{Net working capital}}$$

A close relationship exists between sales and net working capital. With any increase in sales volume there is a corresponding increase in the working capital. Therefore, a good amount of net working capital may be needed to support the increase in sales. The turnover of net working capital is computed to test the efficiency with which net working capital is utilised. In other words, the ratio helps to assess the degree of efficiency in the use of short-term funds for generating sales.

Working capital turnover ratio reveals whether a business is being operated with a small or large amount of net working capital in relation to sales. A very high working capital ratio may be the result of favorable or may reflect an inadequacy of working capital and over trading. On the other hand, a very low ratio may be the outcome of an excess of working capital. Slow turnover of inventories and receivables, large cash balance or investment of working capital in the form of temporary investments. The very low ratio is also an indicator of under trading which means more working capital funds have been invested in the business than needed.

The working capital turnover of the Birla Group of companies in India taking all the seventeen companies of study together and of individual company under study has been shown in the No 4.7 given below

Table No.-4.4
Working Capital Turnover Ratio in the Birla Group of Companies (From 1997-98 to 2002-03)(In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	69.66	67.83	67.65	67.44	77.81	82.92	72.22
MYSORE CEMENT LTD.	19.67	-242.42	-6.11	-16.83	-10.46	-6.38	-43.76
SHREE DIG.CEMENT LTD	10.74	7.78	-5.55	-2.46	-2.32	-1.39	1.13
BIRLA CORPORATIO LTD.	10.94	89.52	-2346.97	31.61	11.73	14.33	-364.8
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	6.45	11.48	25.66	25.33	234.88	-57.88	40.99
KESORAM IND. &CO.MILLS.	6.44	7.23	8.15	5.48	14.42	23.4	10.85
INDIA RAYON & IND.	2.7	2.3	2.4	3.2	3.32	4.01	2.99
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	6.07	11.09	10.12	15.92	23.17	15.7	13.68
HINDALCO IND. LTD.	2.18	1.64	1.66	2.29	2.21	3.48	2.24
ENGINEERING INDUSTRY.							
TEXMACO LTD.	-747	16.28	10.91	26.07	1.74	2.56	-114.9
BIRLA POWER & SOL.LTD.	1.44	2.07	1.77	1.98	2.03	2.03	1.89
WOOL INDUSTRY							
BIRLA VXL. LTD.	4.65	27.87	2.79	2.33	2.28	3.66	7.27
TEA INDUSTY							
JAYSHREE TEA & IND.	3.04	2.41	2.95	3.47	2.55	2.83	2.88
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	5.17	7.33	11.75	9.79	17.12	31.72	13.81
PAPER INDUSTRY							
ORIENT PAPER LTD.	7.017	15.51	9.45	11.86	13.66	27.38	14.14

DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	5.7	5.8	6.6	6.6	5.96	7.52	6.36
BIRLA GROUP	**-36.57**	**2.11**	**-137.29**	**12.13**	**25**	**9.74**	**-20.81**

Sources: - Annual reports and accounts of Birla Group of companies

A look at the data in the above table shows that on an average the Birla Group held on average working capital turnover ratio of minus 20.81 times. There was a varying trend in this ratio. In Hyderabad cement ltd.held the working capital turnover ratio of 72.22 times. There was mix and increasing trend. The ratio ranged 67.44 times in 2000-01 to 82.92 times in 2002-03. The ratio in this company was higher than that at rest companies on the whole. It showed company have utilized its working capital efficiency during starting period under study but after five years the performance showed poor in the case of working capital turnover ratio of the company. Minus 2346.67 in 1999-2000 it showed that the were an excessive investment in working capital and company should require to follow the policy of under trading

Grasim Ind Ltd., India Rayon & Ind., Hindalco Ind.Ltd., Zuari Ltd., and Birla Power and Solution Ltd. had showed mix and increasing trends of the ratio but average were adequate i.e.6.36 times, 2.99 times, 2.24 times, 13.81 times and 1.89 time. There was no need to increase the sales without a corresponding increase in working capital. It is noted that the trend of working capital turnover ratio of all companies describes mix and fluctuated it may be due to market positions.

An interfirm comparison of this ratio showed that Hyderabad cement ltd.had highest working capital ratio followed by century textiles ltd., orient paper ltd., Zuari ltd., Hindustan motor ltd. Kesoram mills, and Birla V.X.L.ltd. while from lowest side Birla corporation ltd.followed by texmaco ltd., Mysore cement ltd.and Shree digvijay cement ltd. It is advised to follow the policy of overtrading for highest turnover company while remains companies should require following the policy of under trading. Thus, Working capital turnover ratio facilitates to assess the degree of efficiency in the use of short-term funds for generating sales.

Working capital turnover ratio of Birla group of companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between working capital turnover ratio of Birla group of companies

Alternative Hypothesis: There is significant difference between working capital turnover ratio of Birla groups of companies.

Level of significance: 5 percent.

Statistical test used: Krukal Wallis one-way analysis variance test.

Critical value: 24.996

Table No.-4.4.1
Comparative of Working Capital Turnover Ratio of Birla Group of Companies.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	69.66	92	19.7	79	10.7	63	10.94	65	6.45	51	6.44	50	2.7	32	6.07	49
1998-99	67.83	91	-242	3	7.78	58	89.52	95	11.48	67	7.23	55	2.3	26	11.09	66
1999-00	67.65	90	-6.1	8	-5.55	9	-2347	1	25.66	83	8.15	59	2.4	28	10.12	62
2000-01	67.44	89	-17	5	-2.46	10	31.61	87	25.33	82	5.48	45	3.2	37	15.92	76
2001-02	77.81	93	-10	6	-2.32	11	11.73	68	234.9	96	14.42	73	3.32	38	23.17	80
2002-03	82.92	94	-6.4	7	-1.39	12	14.33	72	-57.9	4	23.4	81	4.01	42	15.7	75
Total Rank		**549**		**108**		**163**		**388**		**383**		**363**		**203**		**408**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	J.TEA	R13	ZRY	R14	OPR	R15	GRM	R16
2.18	22	-747	2	1.44	13	4.65	43	3.04	36	5.17	44	7.02	54	5.7	46
1.64	14	16.3	77	2.07	21	27.87	86	2.41	29	7.33	56	15.51	74	5.8	47
1.66	15	10.9	64	1.77	17	2.79	33	2.95	35	11.75	69	9.45	60	6.6	53
2.29	25	26.1	84	1.98	18	2.33	27	3.47	39	9.79	61	11.86	70	6.6	53
2.21	23	1.74	16	2.03	19.5	2.28	24	2.55	30	17.12	78	13.66	71	5.96	48
3.48	40	2.56	31	2.03	19.5	3.66	41	2.83	34	31.72	88	27.38	85	7.52	57
	139		**274**		**108**		**254**		**203**		**396**		**414**		**303**

$$H = \frac{12}{N(N+1)} \qquad E = \frac{I}{j} \qquad \frac{k}{Ni} \qquad \frac{(Rj)^2}{-3(N+1)}$$

Where, $n = n1 + n2 + n3 \ldots nk$ and **Rj = sum of the rank**

$$\mathbf{K = \frac{12}{96(96+1)} \left[\frac{(549)^2}{6} + \frac{(108)^2}{6} + \frac{(163)^2}{6} + \frac{(388)^2}{6} + \frac{(383)^2}{6} \right.}$$

$$\frac{(363)^2}{6} + \frac{(203)^2}{6} + \frac{(408)^2}{6} + \frac{(139)^2}{6} + \frac{(274)^2}{6}$$

$$\left.\frac{108)^2}{6} + \frac{(254)^2}{6} + \frac{(203)^2}{6} + \frac{(396)^2}{6} + \frac{(414)^2}{6} + \frac{(303)^2}{6}\right] \quad -3\,(96+1)$$

$$= 0.00128865 \quad (268019.333) - 291$$

$$= 345.38 - 291 \qquad = 54.38$$

The Table No.-4.4.1 shows the calculated value of H works out at 54.38, which is more than the critical value of 24.996. Hence the rejection of the null hypothesis is based on Kruskal Wallis analysis of variance test. The acceptance of alternative hypothesis would indicate that all companies' working capital turnover ratio might not be considered equal.

(5) Debtors Turnover: -

The amount of trade debtors depends upon the sales volume, credit expansion practice and the effectiveness of the collection policy. Since debtors constitute a major element of current assets, the credit and collection policies of the business must be under continuous watch. The amount of trade debtors at the end of the accounting period should not exceed reasonable devices to find out as to how many owed days average sales are tied up in the value of amount owed by debtors accounting to the balance sheet.

The debtors turnover or receivables turnover ratio measure how rapidly debtors are collected. Though it is not immediately apparent from the debtors' turnover ratio and therefore, it has to be supplemented by the average collection period, which will be discussed later.

The debtor turnover ratio has been calculated by dividing the amount of sales by the amount of debtors including acceptances. Here the sales figure has been assumed to be of credit sales.

$$\text{Debtors turn over} = \frac{\text{Credit Sales}}{\text{----------}}$$

Debtors + Bill receivable

A high ratio is indicative of shorter timing between sales and cash collection, a low ratio shows that depts are not collected rapidly.

Debtor turnover ratio of the Birla Group of companies in India taking all seventeen Companies of the study as a whole and of the individual Birla Group Company has been shown in table No. - 4.5

Table No.-4.5
Debtor Turnover Ratio in the Birla Group of Companies From 1997-98 to 2002-03 (In times)

COMPANY	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	6.66	6.33	7.75	8.83	9.62	9.66	8.14
MYSORE CEMENT LTD.	14.15	10.7	8.85	11.84	11.69	17.2	12.41
SHREE DIG.CEMENT LTD	6.83	10.07	9.58	8.57	15.03	13.68	10.63
BIRLA CORPORATIO LTD.	13.19	12.99	16.93	19.61	26.02	30.27	19.84
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	9.35	7.93	8.5	8.89	10.11	12.59	9.56
KESORAM IND. &CO.MILLS.	8.83	7.64	7.72	9.34	7.8	9.14	8.41
NDIA RAYON & IND.	8.6	8.5	5.9	7.1	6.94	10.55	7.93
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	8.92	8.11	7.91	7.85	6.82	7.84	**7.91**
HINDALCO IND. LTD.	15.01	14.11	13.22	13.23	11.12	13.19	**13.31**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	8.92	7.02	5.85	6.82	3.78	3.76	**6.03**
BIRLA POWER & SOL.LTD.	2.78	2.24	2.26	2.53	2.92	2.52	**2.54**
WOOL INDUSTRY							
BIRLA VXL. LTD.	4.66	5.77	3.08	4.67	3.27	3.6	**4.18**
TEA INDUSTY							
JAYSHREE TEA & IND.	4.77	5.5	8.01	7.68	7.68	8.54	**7.03**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	24.48	14.08	12.49	8.79	9.19	7.99	**12.84**
PAPER INDUSTRY							
ORIENT PAPER LTD.	6.01	.5.3	5.19	6.48	7.54	7.37	**6.52**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	6.4	6.7	8	9.1	10.18	12.6	**8.83**
BIRLA GROUP	**9.34**	**8.51**	**8.2**	**8.83**	**9.35**	**10.65**	**9.13**

Sources:-Computed from the Annual A/c's of Birla Group of Co.'s from 1997-98 to 2002-03

The Table No.-4.5 shows that on an average the Birla Group held the Debtor turnover ratio of 9.13 times. There is a varying trend in this ratio which the highest being 19.84 times of Birla Corporation Ltd. and the lowest being 2.54 times of Birla power & solution ltd.

The Debtor turnover ratio In Hyderabad cement ltd.had had been on average of 8.14 times varying from 6.33 times in 1998-99 to 9.66 times in 2002-03. The trends mix and increased during the study period. The efficiency of debt collection period had increased during the study period of time.

In Mysore Cement Ltd. the debtor turnover ratio ranged 8.85 times in 1999-2000 to 17.20 times in 2002-03 with the average of 12.41.the trend was fluctuating whole period of research. In the last years the ratio was very high which showed shorter time lag between sales and cash collection.

In Shree Digvijay Cement Ltd. the debtor turnover ratio showed fluctuating trend throughout the years with an average of 10.63 the average ratio was more than the combined Birla group of companies. The ratio ranged between 6.83 times in 1997-98 and 15.03 times in 2001-02. In the year of 1998-99 and 2001-02 the debt collection efficiency was very good than other years. From the starting period the company was effective in its credit policy.

In Birla Corporation Ltd. the trend was fluctuated throughout the study period ranging from 12.99 times in 1998-99 to 30.27 times in 2002-03 with the average of 19.84 times. The average ratio was more than the combined Birla group of companies. The debt collection was very effective in the last two years.

In Century Textiles Ltd., the Debtor turnover ratio also showed a fluctuating trend. The ratio ranged 7.93 times in1998-99 to 12.59 times in 2002-03 with an average of 9.56 times. The average ratio was more than the combined Birla group of companies. The ratio showed the efficiency of the company positively.

Kesoram Mills. Ltd., showed fluctuating trend of Debtor turnover ratio from 1997-98 to 2002-03. The ratio ranged 7.64 times in 1998-99 and 9.34

times in 2000-01. The ratio normally fluctuated throughout the years of study period. It showed that there is no continuity in debt realization.

Indian Rayon & Ind. showed fluctuating trend. The ratio in 1997-98 was 8.6 times and in 1998-99 the ratio was 8.5 times. Then it decreased to 5.9 times but then after the ratio showed increased trend. The high ratio showed that there is a very short time period between sales and cash realization

The Debt turnover ratio in Hindustan Motor Ltd. was on an average of 7.91 times with the range of 6.82 times in 2000-01 to 8.92 times in 1997-98. The trend was much fluctuated throughout the study period. The debtor turnover ratio of Hindalco ltd. Showed that the debt collection policy is very effective and also the average ratio had been the highest of 13.31 times. The ratio ranged between 11.12 times in 2000-01 to 15.10 times in 1997-98. The average ratio was more than the combined Birla group of companies.

In Texmaco Ltd. the Debtor turnover ratio showed fluctuated trend with an average of 5.99 times in the last two years the debt collection policy was not effective. The Birla power & solution showed average ratio of 2.54 times and the trend was slightly fluctuated.

The Debtor turnover ratio of Birla V.X.L. Ltd. had been on an average of 4.18 times which was very less than the Birla group of companies. It is said that the debt collection policy was not effective.

The Debtors turnover in Jay Shree Tea & Ind. ranged between 4.77 times in 1997-98 to 8.54 times in 2002-03. The average ratio was 7.03 times which more than the combined Birla group of companies was. In the last three years the ratio was normal which showed the debt collection policy so good.

Zuari Ltd. showed decreased trend from 1997-98 to 2000-01. The Debtor turnover increased than after. The highest ratio was 24.48 times in 1997-98 and the lowest ratio was 8.79 times. The debtor turnover was very low.

In Orient Paper Ltd. the ratio had been on average of 6.32 times ranging from 5.19 time's in1999-2000 to 754 times in 2002-03 with the

fluctuating trend. The average ratio was less than the combined Birla group of companies.

The Grasim Ind. showed increased trend of debtor turnover throughout the year of study period. The ratio was ranging 6.4 times in 1997-98 to 12.5 times in 2002-03. The increased debtor turnover ratio increased the efficiency of the company.

An inter-firm comparison reveals the debtor turnover ratio was the highest in Birla Corporation Ltd. followed by Hyderabad Cement Ltd., Mysore Cement Ltd., Shree Digvijay Cement Ltd., Kesoram Ind. Ltd., Hindalco Ltd. and Zuari Ltd. It showed that the company followed an efficiency credit and collection policy.

The Grasim Ind. Ltd. showed increased trend of debtor turnover throughout the study period. The ratio was ranging 6.4 times in 1997-98 to 12.5 times in 2002-03. The increased debtor turnover ratio increased the efficiency of the company.

In other companies the ratio was below the overall average of 9.13 times such as Indian Rayon & Ind., H. M. Ltd., Birla V.X.L., Birla Power and Solutions Ltd., Jay Shree Tea & Ind. Ltd. and Orient Paper Ltd. during almost the whole year of the study period and was towards increase. The turnover increased and the efficiency of the companies in latter years.

Debtor turnover ratio of Birla group of companies and Kruskal Wallis One Way analysis of Variance test:

Table No.-4.5.1

Comparative of debtor turnover ratio of Birla group of Co' s.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	6.66	**25**	14.2	88	6.83	**29**	13.19	**81.5**	9.35	65	8.83	55	8.6	53	8.92	60
1998-99	6.33	**22**	10.7	69	10.1	**69**	12.99	**80**	7.93	44	7.64	35	8.5	49.5	8.11	48
1999-00	7.75	**39**	8.85	57	9.58	**66**	16.93	**91**	8.5	49.5	7.72	38	5.9	20	7.91	43
2000-01	8.83	**56**	11.8	76	8.57	**52**	19.61	**93**	8.89	58	9.34	64	7.1	32	7.85	42
2001-02	9.62	**67**	11.7	75	15	**90**	26.02	**95**	10.11	70	7.8	40	6.94	30	6.82	28
2002-03	9.66	**68**	17.2	92	13.7	**85**	30.27	**96**	12.59	78	9.14	62	10.55	72	7.84	41
Total		**277**		457		**391**		**537**		**365**		294		**257**		**261**

Rank																

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	DPR	R15	GRM	R16
15.01	**89**	8.92	59.5	2.78	5	4.66	12	4.77	14	24.48	94	6.01	21	6.4	23
14.11	**87**	7.02	31	2.24	1	5.77	18	5.5	17	14.08	86	5.3	16	6.7	26
13.22	**83**	5.85	19	2.26	2	3.08	7	8.01	47	12.49	77	5.19	15	8	46
13.23	**84**	6.82	27.5	2.53	4	4.67	13	7.68	36.5	8.79	54	6.48	24	9.1	61
11.12	**74**	3.78	11	2.92	6	3.27	8	7.68	36.5	9.19	63	7.54	34	10.2	71
13.19	**81**	3.76	10	2.52	3	3.6	9	8.54	51	7.99	45	7.37	33	12.6	79
	498		**158**		**21**		**67**		**202**		**419**		**143**		**306**

Null Hypothesis: There is no significant difference between debtor turnover ratios of Birla group of companies

Alternative Hypothesis: There is significant difference between debtor turnover ratios of Birla groups of companies.

Level of significance: 5 percent.

Statistical test used: Krukal Wallis one-way analysis variance test.

Critical value: 24.996

$$H = \frac{12}{N(N+1)} \qquad E = \frac{I}{j} \frac{k}{(Rj)} \frac{2}{Ni} - 3(N+1)$$

Where, n = n1 + n2 + n3 ..nk and **Rj = sum of the rank**

$$H = \frac{12}{96(96+1)} \left[\frac{(277)^2}{6} + \frac{(457)^2}{6} + \frac{(391)^2}{6} + \frac{(537)^2}{6} + \frac{(365)^2}{6} \right.$$

$$\frac{(294)^2}{6} + \frac{(257)^2}{6} + \frac{(261)^2}{6} + \frac{(498)^2}{6} + \frac{(158)^2}{6}$$

$$\left. \frac{(21)^2}{6} + \frac{(67)^2}{6} + \frac{(202)^2}{6} + \frac{(419)^2}{6} + \frac{(143)^2}{6} + \frac{(306)^2}{6} \right] - 3(96+1)$$

= 0.00128865 (281262) –291

= 362.45-291 = 71.45

The Table No.-4.5.1showed comparative analysis of debtor turnover ratio. The calculated value of ' H' is 71.45, which is more the critical value of

24.99. Hence the Null hypothesis is rejected and Alternative hypothesis is accepted and concluded that there is a significance difference between Debtor turnover ratio Birla groups of companies.

(6) Average Collection Period:-

The average collection period measures the quality of debtors since it indicates the rapidity or slowness of their collect ability. According to Recites P. Lewis., "The average collection period is a significant measure of collection activity and the quality of accounts receivables."[20] The shorter the average collection period, the better the quality of customers and the lower the collection expenses. Delays or prolonged hold ups are collection can cause major financial embarrassments. As an alternative sources of funds will have to be arranged for sustaining operations. "Slow paying customers have to be handled tactfully to make prompt payments."[21] The formula for calculating this period can be expressed as follow:

$$\text{Average Collection Period} = \frac{\text{Trade debtors}}{\text{Net credit sales}} \times \text{No. of Days (365)}$$

The average collection period thus, indicates in firm' s efficiency in the collection of receivables. The debtor ratio of Birla group was presented in the below table. A comparative study of the average collection period in all the companies reveals that the recovery and collection policy of Hindalco Ltd, Birla Corporation Ltd. and Zuari Ltd. was better than other companies.

Table No.-4.6 indicates that the average collection period in Hyderabad Cement Ltd. had showed an invariable trend of decrease throughout the study period ranging from 37 days in 2002-03 to 57 days in 1998-99 with average of 46 days. The decrease in the debt collection period is favorable to company. In Mysore Cement Ltd. the average collection period had an invariable trend of fluctuated. It was 25 days in 1997-98 and then increase up to 1999-2000 after it showed decreased trend. The average is 30 days. The decrease in average collection period is favorable to the company. Table No.-12 show the average

collection period of Shree digvijay Cement Ltd. also marked an invariable Trend during the study period. The higher average collection period is a result of lower turnover of accounts receivable which is considered to be bad situation for the company. It indicates the slackness in collection and recovers policy. In Birla corporation ltd. the average collection period 20 days ranging from 12 days 2002-03 to 28 days in 1998-99. The trend decreased showing good collection policy.

Table No.-4.6
Average Collection Period of the Birla Group of Companies
(From 1997-98 to 2002-03) (In days)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	54	57	47	41	37	37	46
MYSORE CEMENT LTD.	25	34	41	30	31	21	30
SHREE DIG.CEMENT LTD	53	36	38	42	24	26	37
BIRLA CORPORATIO LTD.	27	28	21	18	14	14	20
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	39	46	42	41	36	28	39
KESORAM IND. &CO.MILLS.	41	47	47	39	46	39	43
NDIA RAYON & IND.	49	49	68	55	38	58	53
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	40	44	46	46	53	46	46
HINDALCO IND. LTD.	24	25	27	27	32	27	27
ENGINEERING INDUSTRY.							
TEXMACO LTD.	40	51	62	55	96	97	67
BIRLA POWER & SOL.LTD.	131	162	161	144	124	145	145
WOOL INDUSTRY							
BIRLA VXL. LTD.	78	63	118	78	111	101	92
TEA INDUSTY							
JAYSHREE TEA & IND.	76	66	45	47	47	42	54
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	14	25	29	41	39	45	32
P APER INDUSTRY							
ORIENT PAPER LTD.	60	68	70	56	48	49	59
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	66	63	53	47	34	42	51
BIRLA GROUP	**51**	**54**	**57**	**50**	**51**	**51**	**53**

Sources: computed from annual reports on Birla Group of companies.

In Century Textiles Ltd. the average collection period was showing decrease trend with the average of 39 days. The average collection period was

28 days in 2002-03 to 46 days in 1998-99. However the credit policy is not tight. The credit policy was not tight in Kesoram Mills because the average collection period was 44 days ranging from 39 days in 2000-01 to 47 days in 1998-99. The collection policy in Indian Rayon & Ind. had marked invariable trend of fluctuated during the study period. The fluctuated trend shows that the credit policy is not constant.

In Hindustan Motors Ltd. the average collection period had been on an average of 46 days, which fluctuated from 40 days in 1997-98 to 53 days in 2001-02 the trend, increased up to 2001-02 then after it decreased. In Hindalco Ltd. the average collection period was second in the selected units with the average of 27 days. The trend was mix and increasing, however there is a good collection policy.

In Texmaco Ltd. the Debtors collection period had been on an average 67 days ranging from 40 days in 1997-98 to 97 days in 2002-03. The trend was increasing throughout the study period. The increase trend shows that the collection policy is very loose and requires to tight the collection policy. In Birla power & solution ltd. the collection policy had not been effective because the collection period more than 100 days in most of the years. Such type of collection policy increases the risk of bad debt and collection expenses.

In Birla V.X.L Ltd. the average collection period was 78 days in 1997-98 after it decrease to 63 day in 1998-99. Then it increases to 118 days. After these years the trend was increasing which is not favoure to the company.

Jay Shree Tea & Ind. Ltd. had showed the decreased trend throughout the study period. However the average had been 54 days ranging from 45 days in 1999-2000 to 76 days in 1997-98.In the last years the company tightens the collection policy.

In Zuari Ltd. the average collection period had been of 32 days varied from 14 days in 1997-98 to 45 days in 2002-03. The trend was increasing throughout the study Period. The trend showed that the collection policy was not in favour of the company.

In Orient Paper Ltd. the collection period ranged between 48 days in 2001-02 to 70 days in 1999-2000. The trend was decreasing throughout the study period which showed that the collection policy had been in favour to the company.

In Grasim lnd. Ltd., the average had been 51 days varied from 34 days in 2001-02 to 66 days in 1997-98. The trend was decreasing which showed the collection policy is favorable to the company.

On the whole, it can be suggested that. Birla V.X.L Ltd, Texmaco Ltd. Birla Power & Solution Ltd. and Orient Paper Ltd. tighten its credit and collection policy.

Average collection period of Birla Group of companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between average collection periods of Birla group of companies

Alternative Hypothesis: There is significant difference between average collection periods of Birla groups of companies.

Level of significance: 5 percent.

Stastical test used: Krukal Wallis one-way analysis variance test.

Critical value: 24.996

Table No.-4.6.1

Comparative average of collection period of Birla group of co' s

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	54	**68**	25	**9.5**	53	**66**	27	**14.5**	39	**32.5**	41	**39**	49	**62.5**	40	**36**
1998-99	57	**72**	34	**23**	36	**24.5**	28	**17.5**	46	**51**	47	**56.5**	49	**61.5**	44	**46**
1999-00	47	**57**	41	**39**	38	**29.5**	21	**5.5**	42	**43.5**	47	**56.5**	68	**80.5**	46	**51**
2000-01	41	**39**	30	**20**	42	**43.5**	18	**4**	41	**39**	39	**32.5**	55	**69.5**	46	**51**
2001-02	37	**28**	31	**21**	24	**7.5**	14	**1.5**	36	**25.5**	46	**51**	38	**29.5**	53	**66**
2002-03	37	**28**	21	**5.5**	26	**12**	14	**1.5**	28	**17.5**	39	**32.5**	58	**73**	46	**51**
Total Rank		**291**		**118**		**183**		**44.5**		**209**		**268**		**377**		**301**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	JTEA	R13	ZRY	R14	OPR	R15	GRM	R16
24	7.5	40	**36**	131	**92**	78	**84**	76	**83**	14	**1.5**	60	**74**	66	**79**

25	9.5	51	**64**	162	**96**	63	**77**	66	**78.5**	25	**10**	68	**80.5**	63	**77**
27	15	62	**75**	161	**95**	118	**90**	45	**47.5**	29	**19**	70	**82**	53	**66**
27	15	55	**69.5**	144	**93**	78	**84.5**	47	**56.5**	41	**39**	56	**71**	47	**57**
32	22	96	**86**	124	**91**	111	**89**	47	**56.5**	39	**32.5**	48	**60**	34	**24**
27	14.5	97	**87**	145	**94**	101	**88**	42	**44.5**	45	**47.5**	49	**61.5**	42	**44**
	84		**418**		**561**		**512.5**		**367**		**150**		**429**		**345**

$$H = \frac{12}{N(N+1)} \qquad E = \frac{I}{j} \frac{(Rj)}{Ni} \quad -3(N+1)$$

Where, n = n1 + n2 + n3 ..nk and **Rj = sum of the rank**

$$\mathbf{K = \frac{12}{96(96+1)} \left[\frac{(291)^2}{6} + \frac{(118)^2}{6} + \frac{(183)^2}{6} + \frac{(44.50)^2}{6} + \frac{(209)^2}{6} \right.}$$

$$\mathbf{\frac{(268)^2}{6} + \frac{(377)^2}{6} + \frac{(301)^2}{6} + \frac{(84)^2}{6} + \frac{(418)^2}{6}}$$

$$\mathbf{\left. \frac{(561)^2}{6} + \frac{(512.5)^2}{6} + \frac{(367)^2}{6} + \frac{(150)^2}{6} + \frac{(429)^2}{6} + \frac{(345)^2}{6} \right] \quad -3(96+1)}$$

$$= \mathbf{0.00128865 \quad (283231.75) - 291}$$

$$\mathbf{= 364.99 - 291}$$

$$\mathbf{= 73.99}$$

The Table No.-4.6.1 shows the calculated value of H works out at 73.99, which is more than the critical value of 24.996. Hence, the rejection of the null hypothesis is based on Kruskal Wallis analysis of variance test. The acceptance of alternative hypothesis would indicate that all companies' average collection period. Ratio might not be considered equal.

Conclusion:-

Chapter titled "ANALYSIS OF LIQUIDITY" describe that its one of the important measurement of the financial position of the business organization. The concept and nature of working capital or current assets denotes that "Investment in current assets is turned over many times in a year.

Investment in current assets such as inventories and book debts (accounts receivable) is realized during the firms operating cycle which is usually less than year."[22] Therefore measurement liquidity has its own important. Importance of liquidity describes that it' s lifeblood and controlling nerve center of the business. Without circulation of blood no one can live, just like without circulation of liquidity business can' t maintain.

The performance of liquidity can be judged by investment in working capital, short-term creditors, and efficiency in working capital. In the present study there where six types of ratios were calculated i.e. current ratio, quick ratio, inventory turn over ratio working capital turnover ratio, debtor turnover ratio, and average collection period. Thus above analysis describe that the need for liquidity to rub day-to-day business activities can' t be over emphasized.

References:

1. S.P.VIJAYASERAP him and K. Rajeshwar Rao, "working capital investment and Financing in public enterprises" The management account, Calcutta, May 1998
2. KUCHHAL S.C. "Financial management –an analytical and conceptual approach"Chaitanya publishing House, Allahbad, 1982, p.155
3. BACKER C. JOHN AND MALATT D.W. "introduction to corporate finance" McGraw Hill Book co. New York, 1936,P.92
4. GOWER PRESS "Financial Management Hand Book" Gower Press, Essex, 1961,P.61
5. PARK COLIN AND JOHN E.GLADSON "working capital" Mac Millan Company, New York, 1963, P.2
6. H.G.GUTHMANN "analysis of financial statement" prentice Hall Inc. New York, 1935,P.63
7. HUSBAND AND DOCKERAY "modern corporation Finance" Richard D.Irwin inc.illinois, 1957,p.554
8. K.RAJESHWAR RAO "Working capital planning and control in public enterprises in India." Ajanta Publications (India), Jawaharlal Nagar, Delhi-110007, 1985, P.4
9. JAMES C. VAN HORNE "Financial Management and policy" prentice Hall of India, New Delhi, 197-E.W. Walker "essentials of financial management" prentice Hall of India.
10. K.P.SINGH, A.K.SINHA AND S.C. SINGH "management of working capital in India, janki prakashan, ashok Rajpath, Patna, 1986, P.12

11. WALKER E.W. "Essential of Financial management" Eastern economy edition. Prentice Hall of India Pvt. Ltd, New Delhi, 1976,P.59
12. R.D.KENNEDY AND S.Y.MCMULLER "financial statements-Forms Analysis and interpretation" Richard D.Irwin inc.illinois, 1985, P.265-266.
13. HAMPTON J.J. "Financial decision-making: concepts, problems, and cases," prentice Hall of India pvt. New Delhi, 1977.
14. GUTHAMAN H.G. "Corporation finance principles and problems" Chaitanya Publishing House, Allah bad, eighth Edition, p.146.
15. JAIN SASHI A "Working capital management of pharmaceutical industry in India" A thesis submitted for the degree of Ph.d., Dept. of commerce and business administration" saurashtra university, Rajkot, 1990,P.12.
16. LAWRENCE J. GITMAN "Principle of managerial finance" Harper and Row Publishers, New York, 1976
17. E.W.WALKER AND W.H.BANGHAN "Financial planning and policy." Harper and Row publisher, New York, 1964, P.151.
18. BROWN J.L AND HOWARDL.R.principles and practices of management accountancy" MacDonald and Evans ltd., London, 1975 P.70
19. N.M.KHANDELWAL "working capital management in small scale industries," Ashish Publishing House, Punjabi Baug, New Delhi 1985 P.No.5
20. RAMA MOORTHY, V.E. Working capital management, (madras: institute of Financial management research, 1976), p.227.
21. Ibid, P.22
22. MAYER R.B.etal. "Contemporary financial management" west publishing co., 1980,p.562

CHAPTER – 5
PRODUCTIVITY ANALYSIS

Concept of Productivity

"Productivity is the basic mission of any organization to provide the maximum welfare for the maximum number. Productivity as a measure of efficiency and effectiveness and as a means of improving the quality of life is generic from achieving the highest output from the limited resources. Productivity implies the certainty of being able to do better than yesterday and keeping the tempo continuously to improve upon. Such continuous improvements are to be generated through the research for new technique, methods, process, materials, software, and expertise coupled with vision and dedicated leader - ship having the ultimate faith in the welfare in the welfare of human system. "[1]

"Productivity means different things to different people. To workers productivity means a speed up in their work pattern. To union leaders it means the opportunities to negotiate for higher wages. To management, it means increased profitability. To customer, it betters goods after costs. To marketing directors productivity improvement increases the firm' s competitiveness abroad by reducing the coat of good sold in foreign market and to economists; it means an increase in country' s standard of living field to gain in output per man-hour. "[2]

Productivity is simply the ratio of output to input. When this ratio is calculated in based price it indicates the change in productivity efficiency over the base year. As the input consist of a number of production factors and elements. Productivity can also be determined separately for each of these factors. Both the output and the input may be expressed in terms of physical units or interims of money.

Productivity is measured as the ratio between the output of a given commodity or service and the inputs used for that product. Productivity ratio is

the ratio of output of wealthy produced to the input of resources used in the process.

Productivity and Production:

Productivity and production are often not distinguished at all. Productivity is" The measure of the efficiency in production factors, inputs, and / or factor / input Services.[3] But production is the amount of absolute flow of product during given period without talking the input factors into consideration.

The term "Productivity" is used with reference to performance in production and measuring efficiency of organization which refers of improvements in productivity.

"A rise in productivity may con note an increase in output with same resources or the same output by utilizing a smaller quantum of resources. If productivity increases in an economy it means that its factors of production and commodity inputs are manifesting increase in their output efficiency" [4] Thus increasing productivity means the increasing efficiency of various resources of production or better results with lesser efforts. Therefore, measurement of productivity indicates results of performance and efficiency of any enterprise or organization. "It is the pivot of all the productive economic activities affecting the cost of production and determining all the variables like the prices, wages, salaries and cost of capital and services."[5] The key to efficiency and higher productivity lies in working better, ensuring quality rather than faster, ensuring only quantity. "One of the best proper uses of team work and competition is to increase productivity."[6]

On the whole it can be said that production is an absolute term and refers to the total value or quality of goods or services produced during a period. Productivity, on the other hand, is such a relative terms as shows not only the value or quantity of output or production but also its relation to the input or resources used in turning out a given amount of output. Increase in production does not necessarily result in increase in productivity.

Productivity and Profitability:

Productivity is a sigh of efficiency in production. It can be raised only when production is carried out in a more economical manner. Lower productivity is of Wastage and inefficiency in the use of resources. Higher productivity results in higher Profits. The level of productivity sees to it that maximum outcome should take place from whatever minimum input one engages in the best of a concern depends upon profits. The level of productivity sees to it that maximum outcome should take place from whatever minimum input one engages in the best of a concern depends upon the maximum profit it draws. The profit earned thus brings in the term ' profitability' . If selling prices are increased. The profitability of an enterprise will also increase but it will have a zero effect on the productivity level. In this c**ontex J. P. Srivastava remarks,** "In between cost and profitability there are actually so many other factors besides productivity. For example, Profitability may have its origin in current scarcity."[7]

Thus profitability does not necessarily increase the real wealth of an enterprise as it may increase whenever either the selling prices are increased or by overlooking the effect of inflation etc. He further points out that "the stresses of development and the market mechanism may be playing their due role in inflating the profitability of a product unit. While rationalization of effort in every direction is the true basis of productivity"[8]

However, Chen and Garrah observe: "with due allowances for temporary current value fluctuations or changes in commodity of product prices there is a strong positive correlation among time series data measuring productivity, profitability, or efficiency. They are of the view; " All these measures indicate a rate of growth in capabilities of organization to fulfill their mission, mainly, to produce and distribute more and better products or services by managing the development and application of technology and human resources." [9] Higher productivity results in higher profit and brings prosperity not only for the concern but also for the workers, the consumers

and the nation as a whole lower cost and higher profit, greater stability and incentive for expansion, widespread market, overall prosperity and growth of industry.

Partial Productivity and Overall Productivity:

Partial of factorial is the productivity of individual factors, which contributes to the overall productivity. In order to obviate the difficulty to the overall arising out of diversity of methods of measurement of units of input of different factors (Material, Labour, Overheads) it is convenient to adopt cost as a convenient measure of productivity. In other words, various input and output factors are measured in terms of money and overall productivity, which measured as follows.

$$\text{Overall productivity} = \frac{\text{Cost of output}}{\text{Cost of input}}$$

Overall productivity e.g. the productivity of the business as a whole at king all input factors together may be determined provided the different inputs are expressed in the same quantitative units.[10] so it is necessary to measure the output and input as a whole and every input separately to determine the productivity ratios.

Measurement of Output

Output is sometimes difficult to measure because it consists of a products or a group of products. It may be measured in terms of sales value or quantity. "Accounting always measures revenues for those goods and services of the responsibility center that are sold to outside customers."[11]

In the present study both sales value and quantity have been taken into account for measuring the output and the units of output which are weighed by a standard selling price selected for the base period.

Measurement of Input

In the accounting measurement inputs called as interims of cost. Although resources which are physical things e.g. a pound of material and an hour of lobour. It is compulsory to measure these physical constraints with

sources common denominator e.g. money for the purpose of management control system."

We need to be extremely cautious of interpreting any productivity gains in any one of the inputs as a gain in labour productivity may reflect. Change in the technological composition of the product.

The interrelationship between the production inputs it is the relative productivity of all the firms inputs that is the dominant sources of its competitive position"[12]

The quantity output of each year has been calculated for each product with adjustment of closing and opening quantity stock. The prices of the year 1997-98 have been taken as the base year prices.

Productivity Accounting:

Production of goods involves three types of cost material, Labour and other costs, Present study of productivity accounting divided in to four types of productivity i.e. .Materials, Labour, overhead and overall.

Materials Productivity:

The cost of materials used in production of ten surpasses, in this view materials are treated as the first factor in production or manufacturing. "Raw materials are the major inputs in an organization and form the bulk which gets converted in to output"[13] Materials is one of the basic inputs which constitutes 50 to 70 percent of the total value of the output of selected companies. Therefore to improve the performance selected companies, material productivity will have to be improved. Computation of material productivity ratios involves the following steps.

Computation of Material Productivity:

For calculating the material productivity ratio, material output (net sales) is divided by the material input the ratio reveals the output received in constant prices per rupees of material input. Suppose the base year material productivity ratio as 100, Material productivity indices have also been calculated. Material index below 100 will mean low productivity and above

100 will mean improvement in productivity in comparison with the productivity of the base year.

Steps for Computation of Material Productivity:

Hypothesis:

For the analysis purpose of material productivity there are two hypothesis based on statistical methods are tested. The first hypothesis is based on Chi-square test while second hypothesis is based on Kruskal Wallis one-way analysis of variance test.

The hypothesis has been tested to overcome the difficulty of understanding and analysis the results. Infect productivity ratios and indices are based on material inputs and total output, which shows to vary over a period of time, the resulting picture of productivity ratios and indices, also describes fluctuations. Acceptance of the following Null hypothesis will resolve both these difficulties.

[1] Hypothesis Based On Chi-Square:

Null Hypothesis:- Indices of material productivity can be represented by the straight-line trend based on the least square method.

Alternative hypothesis: - Material productivity indices can' t be described by the line of the best fit.

Level of significance: - 5 percent

Statistical test used: - chi-square

Critical value: - 11.07

Acceptance of null hypothesis would reveal that the calculated value of Chi-square is less then table Value; it means that the null hypothesis is expected and alternative hypothesis if rejected and assumption of researcher is true.

[2] Hypothesis based on Kruskal Wallis one-way analysis of variance Test:

Null hypothesis:-There is no significant different between the material productivity Ratio of the selected Birla group of companies.

Level of significance: - 5 percent

Statistical test used:-Kruskal Wallis one-way analysis variance test.

Critical value: - 24.996

Acceptance of null hypothesis describe that there is no significance Describe that there is no significance difference between material productivity of selected Birla group of companies while rejection of null hypothesis shows that there is significant difference between the material productivity ratio of the selected Birla group of companies

MATERIAL PRODUCTIVITY IN BIRLA GROUP OF Co.' s:

(1) Hyderabad Cement Ltd.:

Table No.-5.1
Analysis of Material Productivity Ratio
In Hyderabad Cement Ltd. (Rs. In crores)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	278.62	146.55	1.9011	0.1613	100	98.632	0.525
1998-99	271.3	146.34	1.854	0.164223	97.522	98.735	0.539
1999-00	270.33	144.75	1.869	0.167352	98.311	98.838	0.534
2000-01	269.75	145.38	1.855	0.16207	97.575	98.941	0.538
2001-02	319.27	161.26	1.93	0.16681	101.52	99.041	0.518
2002-03	331.68	177.18	1.872	0.1534	98.469	99.147	0.534
TOTAL	**1734.27**	**921.46**	**11.281**	**0.97517**	**593.397**	**593.34**	**3.185**
AVE.	**289.045**	**153.576**	**1.88**	**0.16252**	**98.89**	**98.89**	**0.531**
STANDARD DEVIATION =			**1.429**	**A=98.89**	**Chi-square =**		**0.122**
Co-Efficient of Variance			**1.445**	**B=0.0515**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

Table No.-5.1 showed that the ratio of material productivity of Hyderabad Cement Ltd. was fluctuated. In 1997-98 it was 1.9011 while in

2002-03 it a highlight 1.872 with an average of 1.88. The trend was mix and fluctuating. The impact of productivity ratio describes the fluctuation trends in productivity index mainly the study period.

Above table reveals materials productivity of Hyderabad Cement Ltd. was slightly fluctuating during the period of study as shown by the value of co-efficient of variation 1.445. Further in order to test the Null Hypothesis whether the distribution of material productivity indices of Hyderabad cement ltd. confirms to the straight line based on least square method. It was found that the calculated value of chi-square figured at 0.122 is less than the table value. Hence Null Hypothesis is accepted. It showed that Material productivity indices follow the trend value. The computed productivity indices index showed a 0.0515 growth rate per year.

(2) Mysore Cement Ltd.:

Table No.- 5.2

Analysis of Material Productivity Ratio in Mysore Cement Ltd.

(Rs. In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	401.22	155.52	2.579	0.122033	100	95.917	0.387
1998-99	334.54	133.43	2.507	0.118246	97.208	93.665	0.398
1999-00	251.17	113.35	2.215	0.98684	85.886	91.413	0.451
2000-01	358.71	173.7	2.065	0.89195	80.069	89.161	0.484
2001-02	395.85	176.19	2.246	0.93585	87.088	86.909	0.445
2002-03	428.94	181.8	2.359	0.090607	91.469	84.657	0.423
TOTAL	**2170.43**	**933.99**	**13.971**	**3.145526**	**541.72**	**541.722**	**2.588**
AVE.	**361.738**	**155.665**	**2.3285**	**0.524254**	**90.28667**	**90.287**	**0.4313**
STANDARD DEVIATION =			**6.8025**	**A=90.28**	**Chi-Square**	**=2.117**	
Co-EFFICIENT OF VARIANCE			**7.534**	**B=-1.126**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

The table No.-5.2 showed material productivity ratio of Mysore Cement Ltd. had a rising trend e.g. in 1998-99 it was 2.507 while in 1999-2000 it showed 2.215. It ranged between 2.579 in 1997-98 to 2.359 in 2002-03 with an average of 2.3285. It is fact that the overall trend of material productivity showed fluctuated trend.

Above table reveals that material productivity of Mysore Cement Ltd. was marginal fluctuating during the study period as shown by value of co-efficient of variation 7.534. This is further confirmed by X^2 test. The computed value of chi-square 2.117 has been very less than the critical value – 11.07. Hence, the Null hypothesis is accepted and alternative Hypothesis is rejected. It showed that the material productivity indices follow the trend value. The computed value of productivity index showed a negative growth of 1.126 rates per year. It had also been showed that average material requirement per rupee of output for Hyderabad Cement Ltd. amounted to rupee 0.4313

(3) SHREE DIGVIJAY CEMENT LTD.:-

Table No.5.3
Analysis of Material Productivity Ratio
in Digvijay Cement Ltd. (Rs. In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	156.86	46.98	3.338	0.17991	100	117.315	0.299
1998-99	204.48	46.72	4.376	0.218227	131.096	117.443	0.228
1999-00	227.07	53.59	4.237	0.210648	126.932	117.572	0.236
2000-01	174.91	46.64	3.7502	0.246489	112.348	117.701	0.266
2001-02	189.28	42.82	4.4203	0.27231	132.42	117.83	0.226
2002-03	140.1	40.73	3.349	0.180816	103.025	117.959	0.29
TOTAL	**1092.7**	**277.48**	**23.561**	**1.3084**	**705.821**	**705.822**	**1.545**
AVE.	**182.67**	**46.247**	**3.927**	**0.21806**	**117.636**	**117.637**	**0.2575**
STANDARD DEVIATION =			**13.157**	**A=117.363**	**CHI_SQUARE =**		**8.082**
Co-Efficient of Variance			**11.184**	**B=0.0644**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

Table No.-5.3 describes that the ratio 0f material productivity of Shree Digvijay Cement Ltd. was increasing trend i.e.3.338 in 1997-98 in 2002-03 3.439 with mix trend during the study period. It varied from 4.237 in 1999-2000 to 3.7502 in 2000-01 with an average of 3.92

Above table showed that material productivity of Shree Digvijay Cement Ltd. was fluctuating during study period as shown by the value of co-

efficient of variation 11.184. Further in order to test Null Hypothesis whether the distribution of material productivity indices confirms to the strait line based. On least square method it was found that the value of chi-square figured at 8.082 it is less than the table value11.07 hence the null hypothesis is accepted.

(4) BIRLA CORPORATION LTD.:-

Table No.-5.4
Analysis of Material Productivity Ratio
In Birla Corporation Ltd. (Rs. In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	845.52	233.5	3.621	0.24449	100	100.413	0.27616
1998-99	758.22	203.43	3.727	0.26965	102.927	99.803	0.26829
1999-00	868.38	250.25	3.47	0.2346	95.829	99.193	0.28818
2000-01	876.79	242.38	3.617	0.22615	91.889	98.583	0.27644
2001-02	958.55	271.74	3.527	0.23783	97.404	97.973	0.28349
2002-03	942.65	267.72	3.521	0.22583	97.238	97.363	0.284
TOTAL	**5250.11**	**1468.84**	**21.483**	**1.43855**	**593.328**	**100.413**	**1.6779**
AVE.	**875.018**	**244.806**	**3.5805**	**0.23975**	**98.888**	**98.888**	**0.2796**
STANDARD DEVIATION =			**2.34**	**A=98.89**	**CHI_SQUARE =**		**0.0036**
Co-Efficient of Variance			**2.366**	**B= --0305**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

It was reveals from Table No.-5.4 that the material productivity ratio of Birla Corporation Ltd. had mix and raising trend. The ratio varied from 3.470 in 1999-2000 to 3.727 in 1998-99 with an average of 3.5805. However it was 3.621 in 1997-98 than after it increased by 3.372 in 1999-2000. After this year the ratio declined to 3.47, which is lowest among all the years.

The compound value of productivity index showed a negative growth of 0.099 per year. It may also be seen from the table that the average material requirement per rupee of output for Shree Digvijay Cement Ltd. counted to Rs.0.257

The computed value of Chi-square 0.0036 has been less than the table value of 11.07 therefore null hypotheses is accepted and alternative hypothesis

is rejected. It describe that the material productivity indices follows the trend values. It describes that computed value of Productivity index shows a margin of 0.545. It has also been showed that average material requirement per rupees of output for Shree digvijay cement ltd. describe to 0.279.Input-out ratio was lowest in 1997-98 by 0.27166.It indicates that unit achieved its maximum efficiency in that year. The company also showed fluctuating trend as shown the value of co-efficient of variation 2.366 and the standards deviation was 2.34.

(5) CENTURY TEXTILE LTD.:-

Table No. -5.5
Analysis of Material Productivity Ratio
In Century Textiles Ltd. (Rs. In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1933.86	679.42	2.846	0.20936	100	97.373	0.351
1998-99	1943.6	712.75	2.726	0.21211	95.78	97.348	0.366
1999-00	2149.89	776.24	2.769	0.202449	97.29	97.305	0.361
2000-01	2211.94	836.7	2.643	0.20965	92.867	97.296	0.378
2001-02	2243.1	793.1	2.828	0.2166	99.369	97.27	0.353
2002-03	2241.1	798.76	2.805	0.21386	98.55	97.244	0.356
TOTAL	**12723**	**4596.27**	**16.617**	**1.25813**	**593.854**	**583.837**	**2.173**
AVE.	**2120.59**	**766.045**	**2.7695**	**0.20968**	**97.309**	**97.306**	**0.362**
STANDARD DEVIATION =			**2.298**	**A=97.309**	**CHI_SQUARE =**		**0.361**
Co-Efficient of Variaance			**2.361**	**B=-0.013**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

It was apparent from Table No.-5.5 that the material productivity ratio of century textiles. Has an overall rising trend i.g.1998-99 to 2001-02. In the last year it declined to 2.805. The average material productivity ratio showed by figured 2.768. The improvement in efficiency may also been observed from average of material productivity indices which workout as high as 99.369 over the year of 1999-2000.

In Century Textile the computed value of chi-square showed by 0.306 has been less than the critical value of 11.07. Hence null hypothesis is

accepted and Alternative hypothesis is rejected. It showed that the material productivity indices follow trend value which was hypotheses. The calculated value of productivity index showed negative 0.568 per year base. Rs.0.362 observes it from tha table that material requirement per rupees of output average for the unit.

(6) KESORAM TEXTILES LTD.:-

The Table No.-5.6 showed material productivity ratio, Co-efficiencyof co-ralationship, material productivity index, trend values, input output ratio and calculated value of x^2 of Kesoram mills ltd.

Table No .-5.6
Analysis of Material Productivity Ratios
In Kesoram Mills. Ltd. (In crores)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	640.22	197.1	3.248	0.224	100	112.863	0.3078
1998-99	615.92	172.18	3.577	0.25849	110.129	103.772	0.2795
1999-00	608.34	155.18	3.92	0.25849	120.689	94.666	0.255
2000-01	1116.38	501.81	2.224	0.11803	68.47	85.56	0.4494
2001-02	1122.47	483.18	2.323	0.13571	71.52	76.454	0.4304
2002-03	1159.04	510.99	2.268	0.13735	69.872	67.348	0.4408
TOTAL	**5262.35**	**2020.44**	**17.56**	**1.1323**	**540.637**	**540.663**	**2.1629**
AVE.	**877.058**	**336.74**	**2.926**	**0.1887**	**90.113**	**90.113**	**0.3604**
STANDARD DEVIATION =			**21.05**	**A=90.106**	**CHI_SQUARE =**		**12.835**
Co-Efficient of Variance			**23.225**	**B= 4.553**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

The productivity ratio of the unit showed the increasing e.g. in 1997-98 it was 3.248 and in 1999-2000 it was 3.920 but then after it showed decreasing trend.

However it improved slightly to 2.268 in the last year with average of 2.92.Thus the productivity ratio of the company showed mix trend during the study period.

In this unit the calculated value of chi-square is 12.835, which is less than the critical value of 11.07. Hence the null hypothesis is rejected and

alternative hypothesis is accepted. It indicates that the material productivity indices followed trend value. The computed values of productivity index showed growth of 4.553 per annum resulting with dawn ward trend.

The strait line based on trend values showed a down ward trend with positive growth of 4.553 per annum. Thus, Material productivity of the unit under was found to be gradually down ward trend during the period of the study with an overall decreasing trend during the period of study.

(7) INDIAN RAYON & IND. LTD.:-

Table No.-5.7 showed the material productivity ratio, co-efficiency of co- relationship, productivity index of material indices, value of chi-square, co-efficient of variation for Indian rayon & Ind.

Table No.-5.7
Analysis of Material Productivity Ratios
In Indian Rayon & Ind. Ltd. (In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1582.25	474.64	3.333	0.19701	100	87.726	0.299
1998-99	1299.03	501.72	2.589	0.18212	77.677	81.798	0.386
1999-00	1072.09	507.81	2.111	0.13258	63.336	75.87	0.473
2000-01	1416.19	648.11	2.185	0.14936	65.556	69.942	0.457
2001-02	1410.63	645.8	2.184	0.1521	65.526	64.014	0.457
2002-03	1443.82	662.66	2.178	0.14512	65.346	58.144	0.458
TOTAL	**8223.91**	**3440.74**	**14.578**	**0.95829**	**437.441**	**437.494**	**2.58**
AVE.	**1370.65**	**573.456**	**2.429**	**0.1597**	**72.916**	**72.916**	**0.43**
STANDARD DEVIATION =			**21.049**	**A=72.90**	**CHI_SQUARE =**		**5.198**
Co-Efficient of Variance			**28.711**	**B=--2.964**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

The above table reveals that material productivity of Indian Rayon & Ind. Ltd. declining trend from 1997-98 to 1999-2000 but then after it showed increased trend during the study period .The overall ratio showed declining trend i.e. from 3.333 in 1997-98 to 2.178 in 2002-03 with an average of 2.429. The material productivity ratio has been fluctuating from lowest of 2.111 in 1999-2000 and highest 3.33 in 1997-98. The impact of above zigzag

movement observed in indices than average of productivity indices showed below than the based year (i.e.72.906)

The co-efficient of variation showed 28.711 percent and the value of chi-square remained at 5.198 which less than the critical value of 11.07 therefore the null hypothesis is accepted and alternative hypothesis is not accepted .It showed the material productivity indices follows than trend values. The computed value of productivity index showed a negative growth of 2.964 per year resulting in a down ward trend. All these factors showed the declining conditions of the company. These are not regarded as a good sigh and this downward trend in material efficiency should be required to control.

(8) HINDUSTAN MOTOR LTD.:-

Table No.-5.8
Analysis of Material Productivity Ratios
In Hindustan Motor Ltd. (In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1003.27	642.18	1.562	0.11684	100	94.323	0.64
1998-99	1217.58	861.33	1.413	0.09327	90.46	94.310	0.707
1999-00	1330.81	953.8	1.395	0.085992	89.308	94.297	0.716
2000-01	1233.28	843.4	1.462	0.09799	93.597	94.284	0.683
2001-02	692.66	584.98	1.525	0.12819	97.631	94.271	0.655
2002-03	**792.22**	**535.05**	**1.48**	**0.106233**	**94.75**	**94.259**	**0.675**
TOTAL	**6469.82**	**4420.74**	**8.837**	**0.628515**	**565.746**	**565.746**	**4.076**
AVE.	**1044.97**	**736.79**	**1.4728**	**0.104753**	**94.291**	**94.291**	**0.67933**
STANDARD DEVIATION =			**3.95**	**A=94.29**	**CHI_SQUARE =**		**0.890**
Co-Efficient of Variance			**4.186**	**B=-0.0064**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.8 showed the material productivity ratio, Co-efficiency of co-relationship, productivity index, trend value, and input-output ratio, Standard deviation-efficient of variation and value of chi-square for Hindustan Motor Ltd.

The Table No-5.8 reveals that the material productivity of the company showed mix trend, with downward direction. From 1997-98 to 1999-2000 it

showed by figures 1.562 to 1.395. Up to 1999-2000 to based years it showed aggregately down ward trend but then it increased up to 2001-2002 with an average of 3.95

The productivity index also showed mix trend with down ward direction and average showed 94.29.During the study period as in shown by co-efficient of variation1.186 and standard deviation 3.95.it is further confirms by chi-square test. Further in order to measure null hypothesis by the norms of strait line based on least square method it was found that the value of chi-square figured at 0.890 which less than the critical value of 11.07.therefore null hypothesis is accepted and alternative hypothesis is rejected. Computed value of productivity index annual growth is (-)0.0064, which does not show good pattern of material productivity of Hindustan motor ltd.

(9) HINDALCO. LTD.:-

The table No.-5.9 showed the productivity ratio, production index, trend value, co-efficient of co-relationship, Chi-square value, output and input and standard deviation.

Table No.- 5.9
Analysis of Material Productivity Ratios in Hindalco Ltd.
(In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1474.27	373.65	3.945	0.2541	100	113.59	0.253
1998-99	1768.01	447.29	3.952	0.258	100.17	106.948	0.252
1999-00	20.32.43	459.61	4.422	0.3015	112.09	100.306	0.226
2000-01	2276.65	504.08	4.516	0.29828	114.47	93.664	0.221
2001-02	2332.98	562.41	4.148	0.27398	105.145	87.022	0.241
2002-03	4980.9	2522.68	1.974	0.08069	50.038	80.38	0.506
TOTAL	**14865.2**	**4869.72**	**22.957**	**1.46655**	**581.913**	**581.91**	**1.699**
AVE.	**2477.54**	**811.62**	**3.8262**	**0.244425**	**96.985**	**96.985**	**0.2832**
STANDARD DEVIATION =			**21.694**	**A=96.98**	**CHI_SQUARE =**		**23.289**
Co-Efficient of Variance			**22.369**	**B=--3.321**			

SOURCE: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS.

The above table showed the productivity ratio which indicate the mix and increased trend e.g. the ratio increased from 1997-98 by 3.945 to 4.516 in 2000-01. Then after the ratio declined to 4.148 and 1.974 in the year of 2001-

02 and 2002-03.Index also showed the same situation as productivity ratio. The ratio ranged between 1.974 in 2002-03 to 4.516 in 2000-01 with an average of 3.829.

In this unit the calculated value of chi-square is 23.289, which less than the critical value of 11.07.Hence the null hypothesis is rejected and alternative hypothesis is accepted. It indicates that the material productivity indices do not follow the trend value .The compound value of productivity index showed negative growth 3.321 per annum resulting with down ward trend.

It observed from the table that material required per rupees of output amounted toRs.1.69.Input-output ratio was the lowest in 2000-2001 by the figured Rs. 0.221 which indicates that the unit achieved its maximum efficiency in this year.

The strait line based on trend values showed an upward trend with growth rate of 0.221 per annum. Thus, material productivity of the unit under was found to be gradually down ward trend during the period of study with an overall decreasing trend during the period of study

(10) TEXMACO LTD.:-

The table No.-5.10 showed that the ratio of material productivity of Texmaco Ltd. was increases e.g. in 1997-98 it showed 1.502 while in 1998-99 it was 1.632 with an average of 1.67.from 1999-2000 to 2002-03 it showed decreased trend in between the ratio remained 1.946 to 1.636.The highest ratio was in the year of 1999-2000 which indicates the efficiency use of material .The impact of productivity ratio displayed the mix and decreased trend during the study period

Above table reveals that material productivity of Texmaco Ltd. was down ward trend. During the period of study as shown by value of co-efficient of variation 9.761.This is further confirmed by X^2 test. The computed value of chi-square 4.216 has very less than the critical value of 11.07. Hence the null

hypothesis is accepted and alternative hypothesis is rejected. It showed that the material productivity indices follow the trend values. The computed value of productivity indices showed a 0.40 growth rate per year. It has also been showed that the average material requirement per rupee of output for Texmaco Ltd. amounted to 0.601

TABLE NO.-.5.10
Analysis of Material Productivity Ratios in Texmaco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	246.62	164.16	1.502	0.1247	100	109.194	0.665
1998-99	182.79	111.94	1.632	0.13809	108.65	109.994	0.612
1999-20	133.65	68.67	1.946	0.1789	129.56	110.794	0.513
2000-01	140.52	84.57	1.661	0.14357	110.58	111.594	0.601
2001-02	95.85	58.27	1.644	0.133	109.454	112.394	0.607
2002-03	124.36	75.97	1.636	0.134	108.92	113.194	0.61
TOTAL	**923.76**	**563.56**	**10.02**	**0.85219**	**667.164**	**667.164**	**3.608**
AVE.	**153.96**	**93.9267**	**1.67**	**0.142032**	**111.194**	**111.194**	**0.60133**
STANDARD DEVIATION =			**9.761**	**A=111.19**	**CHI_SQUARE =**		**4.216**
Co-Efficient of Variaance			**8.778**	**B=0.40**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

(11) BIRLA POWER & SOLUTION LTD.:-

It was apparent in table no.- 5.11 that the Material productivity ratio of Birla Power & Solution Ltd. has a very overall falling trend from 1997-98 to 2002-03. However it increased by 1.957 in 2001-02. The average of material productivity ratio showed by figured 1.954.There is no more improvement in efficiency found from average of material productivity indices. The ratio was high figured 2.078 in 1998-99 and the lowest ratio found 1.65 in 2002-03.

TABLE NO.- 5.11
Analysis of Material Productivity Ratios in Birla Power & Solution Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O

1997-98	65.7	29.94	2.194	0.14258	100	100.059	0.455
1998-99	62.86	30.24	2.078	0.15168	94.712	95.671	0.481
1999-20	61.32	30.11	2.069	0.15523	94.302	91.283	0.491
2000-01	65.29	36.64	1.781	0.13607	81.175	86.895	0.561
2001-02	69.35	35.43	1.957	0.14988	89.197	82.507	0.51
2002-03	71.17	43.13	1.65	0.12072	75.205	78.119	0.606
TOTAL	**395.69**	**205.49**	**11.729**	**0.8556**	**534.591**	**534.534**	**3.104**
AVE.	**65.9483**	**34.249**	**1.9548**	**0.1426**	**89.0985**	**89.089**	**0.517**
STANDARD DEVIATION =			**8.497**	**A=89.09**	**CHI_SQUARE =**		**1.137**
Co-Efficient of Variance			**9.538**	**B=-2.194**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

In Birla Power & Solutions Ltd. the computed value of chi-square showed 1.137 has been less than the critical value 11.07. Hence null hypothesis is accepted and alternative hypothesis is not considered. It shows that the material productivity indices follow trend value. The calculated value of productivity index by (-) 2.194 it is observed from the table that material required per rupees of output average by Rs. 0.517 for the unit.

(12) BIRLA V.X.L LTD:-

The table no.-5.12 showed that the ratio of material productivity of Birla V.X.L.Ltd. was increases e.g. in 1997-98 it showed 2.611 while in 1998-99 it highlights 2.826 with an average of 2.943 and mix trend. It showed declined trend from 1998-99 to 2002-03. The ratio ranged between 2.263 in 2002-03 and 2.826 in 1998-99. The impact of productivity ratio described the decreased trends in productivity index mainly the study period.

Above table reveals that material productivity of Birla V.X.L Ltd., was slightly fluctuating during the period of study as shown by value of co-efficiency of variation 8.826. Further, in order to test the null hypothesis whether the distribution of material productivity indices of Birla VXL Confirms to the strait line based on least square method. It was found that the calculated value of chi-square figured at 1.324 is less than the table value 11.07.Hence null hypothesis is accepted and alternative hypothesis is rejected. The computed value of productivity index showed a negative growth 2.051.

TABLE NO.-5.12
Analysis of Material Productivity Ratios In Birla V.X.L. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	482.9	184.92	2.611	0.19205	100	105.74	0.382
1998-99	583.23	206.37	2.826	0.22008	108.23	101.638	0.353
1999-00	251.21	93.96	2.673	0.21711	102.37	97.536	0.374
2000-01	335.28	145.25	2.308	0.19243	88.39	93.434	0.433
2001-02	230.46	101.15	2.278	0.20133	87.246	89.332	0.438
2002-03	232.54	102.75	2.263	0.20894	86.671	85.23	0.441
TOTAL	**2115.62**	**834.4**	**14.959**	**1.23194**	**572.907**	**572.91**	**2.421**
AVE.	**352.603**	**139.07**	**2.4932**	**0.205323**	**95.4845**	**95.485**	**0.4035**
STANDARD DEVIATION =			**8.427**	**A=95.48**	**CHI_SQUARE =**		**1.324**
Co-Efficient of Variance			**8.826**	**B=--2.051**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

(13) JAY SHREE TEA & IND. LTD.:-

TABLE NO.-5.13
Analysis of Material Productivity Ratios in Jay Shree Tea & Ind. Ltd. (In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	211.42	62.7	3.371	0.37283	100	96.397	0.296
1998-99	203.48	60.84	3.344	0.350396	99.2	97.155	0.298
1999-00	190.94	65.8	2.901	0.3221	86.05	97.913	0.344
2000-01	159.72	50.14	3.185	0.34984	94.482	98.671	0.313
2001-02	144.55	36.58	3.951	0.41485	117.2	99.429	0.253
2002-03	156.59	50.04	3.129	0.34331	92.821	100.187	0.319
TOTAL	**1066.7**	**326.1**	**20.881**	**2.1533**	**589.76**	**589.752**	**1.823**
AVE.	**177.783**	**54.35**	**3.48**	**0.358883**	**98.292**	**98.292**	**0.3038**
STANDARD DEVIATION =			**9.6226**	**A=98.29**	**CHI_SQUARE =**		**5.51**
Co-Efficient of Variance			**9.79**	**B=0.379**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The table No.-5.13 showed the material productivity ratio of Jay shree & Ind. The ratio showed increased trend from 1999-2000 to 2002-03. The ratio figured 2.901 to 3.129 in these years. In the first year the ratio was 3.371 than after in declined to 3.344 with an average of 3.48. The productivity ratio of the company was showing mix and down ward trend during the study period.

In this unit the calculated value of chi-square is 5.51 is less than the critical value of 11.07. Hence the null hypothesis is accepted and alternative hypothesis has been rejected. It concludes that the material productivity indices followed the trend value. The computed values of productivity index showed growth of 0.379 per year. With the down ward trend

It was seen from the table that material required per Rupees of output amounted to Rs. 0.303.Input –output ratio was the lowest in 1999-2000 by figured Rs. 2.901 which shows that the unit achieved its maximum efficiency in this years. The strait line based on trend values showed a down ward trend with slight growth of 0.379 per year. Thus material productivity of the unit was quite decreasing during the study period.

(14) ZUARI AGRO. IND. LTD.:-

TABLE NO.- 5.14
Analysis of Material Productivity Ratios in Zuari Agro & Industry Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	928.69	562.46	1.651	0.0543	100	103.019	0.605
1998-99	834.79	498.71	1.673	0.05758	101.332	97.527	0.597
1999-00	1322.07	853.34	1.549	0.04266	93.821	92.035	0.645
2000-01	1210.11	881.67	1.372	0.041359	83.101	86.543	0.728
200102	1228.96	902.39	1.361	0.03916	82.434	81.051	0.734
2002-03	10.41	840.32	1.239	0.04298	75.045	75.559	0.806
TOTAL	**6566.46**	**4538.89**	**8.845**	**0.279039**	**535.733**	**535.734**	**4.097**
AVE.	**1094.41**	**756.482**	**1.4742**	**0.04634**	**89.289**	**89.289**	**0.68283**
STANDARD DEVIATION =			**9.7337**	**A=89.29**	**CHI_SQUARE =**		**0.436**
Co-Efficient of Variance			**10.901**	**B=--2.746**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The trend of material productivity ratio showed down ward trend through the year of research period. The ratio was 1.651 in 1997-98 then after it declined to 1.673 in 1998-99. The ratio ranged between 1.361 in 2001-02 to 1.673 in 1998-99 with an average 1.47. The high ratio showed better utility of

material to have maximum output Impact of fluctuations laid on the productivity index it showed same trend as material productivity ratio.

Above table also reveals that the value of co-efficient of variation is 9.733 and the value of standard deviation is 10.90. It was further confirmed by chi-square test. For testing of the null hypothesis for above company by the norms of straight-line based on least square method. It was found that the value of X^2 figured at 0.436, which is less than the critical value, and null hypothesis, is accepted and alternative hypothesis is rejected. It is concluded that the material productivity indices follows trend values. The computed value of productivity index showed a growth (-) 2.746 per year with down ward trend.

(15) ORIENT PAPER LTD.:

TABLE NO.- 5.15
Analysis of Material Productivity Ratios in Orient Paper Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	555.75	219.3	2.534	0.15764	100	97.895	0.394
1998-99	546.37	237.4	2.301	0.1646	90.805	100.473	0.434
1999-00	488.79	185.3	2.637	0.18527	104.06	103.051	0.379
2000-01	551.71	192.46	2.866	0.18696	113.1	105.629	0.348
2001-02	583.71	194.56	3	0.194088	118.389	108.207	0.333
2002-03	589.22	233.21	2.526	0.158825	99.684	110.785	0.395
TOTAL	**3315.55**	**1262.23**	**15.864**	**1.0473**	**626.038**	**626.04**	**2.283**
AVE.	**24.0917**	**210.372**	**2.644**	**0.17455**	**104.3397**	**104.34**	**0.3805**
STANDARD DEVIATION =			**9.109**	**A=104.34**	**CHI_SQUARE =**		**3.584**
Co-Efficient of Variance			**8.73**	**B=1.289**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No-5.15 showed the material productivity ratio, Co-efficiency of co-relationship, Productivity index of material indices, Value of chi-square, Co-efficient of variation for Orient Paper Ltd.

The table reveals that material productivity of Orient Paper Ltd. through the period under study. The overall ratio showed increased trend from

2.301 in 1998-99 to 3 in 2001-02 with an average of 2.64. The material productivity ratio has been fluctuating during the period ranging from the lowest of 2.301 in 1998-99 and highest of 3 in 2001-02. The impact of above zigzag movement observed in indices the average of productivity indices showed below than the base years. 90.805.

The co-efficient of variation showed 8.73 percent the value of value chi-square remained at 3.284 which is less than the critical value 11.07. Therefore null hypothesis is accepted and alternative hypothesis is rejected. It showed the material productivity indices follow the trend value. All these factors showed the increased condition of the company. These are regarded as a good sigh in use of material efficient.

(16) GRASIM IND. LTD.:-

Table No.-5.16
Analysis of Material Productivity Ratios in Grasim Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	3499.89	1619.63	2.16	0.11668	100	92.625	0.4213
1998-99	3756.87	1798.42	2.088	0.1138	96.66	102.655	0.4398
1999-00	4272.62	1854.15	2.304	0.13074	106.66	112.685	0.4765
2000-01	4821.71	1796.29	2.684	0.148502	124.25	122.715	0.4518
2001-02	4372	1500.87	2.914	0.16911	134.907	132.745	0.5321
2002-03	4609	1483.99	3.105	0.16978	143.75	142.775	0.5742
TOTAL	**25332.1**	**10053.4**	**15.255**	**0.848612**	**706.227**	**706.2**	**2.8958**
AVE.	**4222.02**	**1675.55**	**2.5425**	**0.141435**	**117.7**	**117.7**	**0.48263**
STANDARD DEVIATION =			**17.774**	**A=117.70**	**CHI_SQUARE =**		**1.32**
Co-Efficient of Variance			**15.1**	**B= 5.015**			

SOURCES:- COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The trend of material productivity ratio showed up ward since 1998-99 to 2002-03 with an average of 2.542. It was varied from 2.088 in 1998-99 to 3.105 in 2002-03. However after firs year of study period it declined to 2.088 but then after it showed increasing trend.

Impact of fluctuations laid on the productivity index it showed same trend as material ratio. The average of material productivity indices is workout to be at 117.70 over the base year. Further above table reveals that value of co-efficient of variation 15.10 and the value standard deviation 17.77.It was further confirmed by chi-square test.

For testing the null hypothesis of above company by norms of straight-line based on least square method. It was found that the value of X^2 figured at 1.32, which if less than the table value 11.07.There for null hypothesis is accepted and alternative hypothesis is rejected. The computed value of productivity index showed a growth of 5.015 per year with upward trend

Material productivity ratios of selected birla group of companies and kruskal Wallis one-way analysis of variance test.

Kruskal Wallis test is use full measurement tool for to test the null hypothesis that 'K' independent random samples come from identical universes against the alternative hypothesis. It indicates that the universe is not equal. The comparative position of material productivity ratios of the selected Birla group of companies have been discussed in table No.5.17 and with the application of Kruskal Wallis one way analysis of variance test on these ratio

Table No.-5.17 describe that the calculation value of 'H' equals to 70.65 which is less than the table value of 24.996 hence the null hypothesis based on Kruskal Wallis one way analysis of variance test at 5 percent level of significant rejected.

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk and Ri=sum of the rank

TABLE NO.-5.17
Comparative material productivity ratios of selected companies with kruskal Wallis one-way analysis of variance

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	1.901	**24**	2.579	**53**	3.338	**75**	3.621	**84**	2.846	**65**	3.248	**73**	3.333	**74**	1.56	**11**
1998-99	1.854	**20**	2.507	**50**	4.376	**93**	3.727	**85**	2.726	**60**	3.577	**82**	2.589	**54**	1.41	**5**
1999-00	1.869	**22**	2.215	**39**	4.237	**92**	3.47	**79**	2.769	**61**	3.92	**87**	2.111	**33**	1.4	**4**
2000-01	1.855	**21**	2.065	**29**	3.75	**86**	3.617	**83**	2.643	**57**	2.224	**40**	2.185	**37**	1.46	**6**
2001-02	1.93	**25**	2.246	**41**	4.42	**95**	3.527	**81**	2.828	**64**	2.323	**48**	2.184	**36**	1.53	**9**
2002-03	1.872	**23**	2.359	**49**	3.349	**77**	3.521	**80**	2.805	**62**	2.268	**43**	2.178	**35**	1.48	**7**
Total Rank		**135**		**261**		**518**		**492**		**369**		**373**		**269**		**42**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
3.945	**88**	1.502	**8**	2.194	**38**	2.611	**55**	3.371	**78**	1.651	**16**	2.534	**52**	2.16	**34**
3.952	**90**	1.632	**12**	2.078	**31**	2.826	**63**	3.344	**76**	1.673	**18**	2.301	**45**	2.09	**32**
4.422	**95**	1.946	**26**	2.069	**30**	2.673	**58**	2.901	**24**	1.549	**10**	2.637	**56**	2.3	**46**
4.516	**95**	1.661	**17**	1.781	**19**	2.308	**47**	3.185	**72**	1.372	**3**	2.866	**66**	2.68	**43**
4.148	**91**	1.644	**14**	1.957	**27**	2.278	**44**	3.951	**89**	1.361	**2**	3	**69**	2.91	**68**
1.974	**28**	1.636	**13**	1.65	**15**	2.263	**42**	3.129	**71**	1.239	**1**	2.526	**51**	3.11	**70**
	487		**90**		**160**		**309**		**410**		**50**		**339**		**293**

$$K = \frac{12}{96(96+1)}\left[\frac{(135)^2}{6} + \frac{(261)^2}{6} + \frac{(518)^2}{6} + \frac{(492)^2}{6} + \frac{(369)^2}{6}\right.$$

$$\left.\frac{(373)^2}{6} + \frac{(269)^2}{6} + \frac{(42)^2}{6} + \frac{(487)^2}{6} + \frac{(90)^2}{6}\right.$$

$$\left.\frac{(160)^2}{6} + \frac{(309)^2}{6} + \frac{(410)^2}{6} + \frac{(50)^2}{6} + \frac{(339)^2}{6} + \frac{(293)^2}{6}\right] - 3(96+1)$$

= 0.00128865 (280644.83) –291

= 361.65 -291

= 70.65

The acceptations of alternative hypothesis and rejection of null hypothesis described there is significant different between the material production ratios of the selected companies.

Comparative Analysis of Material Productivity:-

TABLE NO.-5.18

Comparative Analysis of Material Productivity

	O/I RATIO		PRO. INDEX		CO-EFF.		CHI-SQ.		I/O RATIO		GROWTH RATE		OVER ALL	
	AVE.		AVE.						AVE.					
COMPANY	VAL.	RANK	VAL.	RNK	VAL.	RNK	VAL.E	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK
CEMENT														
HYD.	1.88	13	98.899	5	1.445	16	0.121	16	0.531	4	0.052	8	62	6.5
MYSORE	2.328	11	90.28	12	7.534	13	2.117	8	0.431	7	-1.13	12	63	4
SHREE DIG.	3.927	1	117.63	2	11.18	5	8.082	3	0.257	16	0.064	7	34	14
BIRLA COR.	3.58	3	98.888	6	2.366	14	0.243	15	0.279	15	-0.31	11	64	2
TEXTILES														
CENTURY TEX.	2.769	6	97.3	8	2.361	15	0.73	13	0.362	11	-0.01	10	63	4
KESORAM.	2.926	5	90.1	13	23.23	1	9.673	2	0.36	12	4.553	2	35	13
INDIA RAYON	2.429	10	72.9	16	21.05	3	5.66	4	0.43	8	-2.96	16	57	9
AUTO & ALLM														
H.M.T.	1.472	16	94.29	11	4.186	13	0.886	11	0.679	2	-0.01	9	62	6.5
HINDALCO	3.826	2	96.98	9	22.37	2	24.23	1	0.283	14	3.321	3	31	16
ENGINEERING														
TEXMACO LTD.	1.67	14	111.19	3	8.778	10	3.343	6	0.601	3	0.4	5	41	12
B.P.&S	1.954	12	89.09	15	9.538	8	1.234	9	0.517	5	-2.19	14	63	4
WOOL														
BIRLA VXL	2.493	9	95.848	10	8.826	9	0.964	10	0.403	9	-2.05	13	60	8
TEA INDUSTY														
JAYSHREE TEA	3.48	4	98.29	7	9.79	7	5.41	5	0.303	13	0.379	6	42	11
CHEMICAL														
ZUARI IND.	1.48	15	89.288	14	10.9	6	0.299	14	0.683	1	-2.75	15	65	1
PAPER														
O.PAPER	2.644	7	104.34	4	8.73	11	3.318	7	0.3805	10	1.289	4	43	10
DIVERSIFIED														
GRASIM	2.542	8	117.7	1	15.1	4	0.785	12	0.482	6	5.015	1	32	15
BIRLA GROUP	**2.588**		**97.688**		**10.46**		**4.189**		**0.436**		**0.23**		**51.63**	

The Table No. 5.18 showed overall picture of material productivity. It includes Out-put input ratio with rank, co-efficient factory, input-output ratio, profitability index, growth rate and the value of chi-square.

LABOUR PRODUCTIVITY:-

The terms "labour productivity is generally defined as "the ratio of physical amount of output achieved in a given period to the corresponding amount of lobour expended"[14]. It may be true that any business organization all wage payments are directly or indirectly based on the skill and productivity

of the workers, therefore labour productivity is considered as the most important factors in productivity computations. There are various types of methods for calculating the labour productivity. Very simple method describe in the above definition. ' Output divided by input' another method the output per man-years of man-hour and the input per man-years or per man-hour. In the present research study labour input calculated by cost/expenses labour productivity and capacity of utilization could be general indices, which are easily understandable and could be the basis for measurement of the employees.

STEPS IN ACCOUNTING FOR LABOUR PRODUCTIVITY:

HYPOTHESIS:-

For the purpose of measuring the labour productivity, two null hypotheses have been tested with two alternative hypothesis for the purpose of analysis labour productivity indices. The firth hypothesis shows whether the labour productivity indices can be approximately as a straight-line trend. The second hypothesis is whether there is any significant difference the labour productivity of the selected unit of Birla Group.

HYPOTHESIS BASED ON CHI-SQURE: -

Null Hypothesis:- The labour productivity indices may be represented by the straight line based on least square method.

Alternative hypothesis: the line of the fit can' t describe -Labour productivity indices.

Level of significant: - 5 percent

Statistical tool used: -chi-square test

Critical value: - 11.07

If the calculated value of chi-square remains less than the critical value the null hypothesis would mean that the computed value of the indices is based on the least square straight line trend. It may represent the pattern and growth of the labour productivity.

HYPOTHESIS BASED ON KRUSKAL WALLIS ONE WAY ANALYSIS OF CARIANCE:

The second hypothesis is based on kruskal Wallis one-way analysis of variance distribution free test. The acceptance of null hypothesis would mean that there is no significant difference between the labour productivity of the Birla Group of Companies. On the other hand the rejection of null hypothesis would be possible only if the calculated value exceeds the critical value. In case alternative hypothesis will be accepted which describe that there is significant difference between the labour productivity of Birla Group Companies. The null and alternative hypothesis describe below.

Null hypothesis:-There is no significant different between the labour productivity ratios of the selected units of Birla Group of Companies.

Alternative hypothesis: **-**There is significant difference between the labour productivity of Birla Group of Companies

Level of significant: - **5 percent**

Statistical tool used: - **Kruskal Wallis.**

Critical value**: - 11.07**

The rejection of null hypothesis describe that there is significant different between the labour productivity ratio of the selected companies. While acceptance of null hypothesis shows that there is no significance difference between labour productivity of selected birla Group of companies.

Labour productivity in selected companies: -

Table No. 5.19 to 5.36 describes the labour productivity ratio and index of labour productivity average of labour indices, co-efficient of variation and value of chi-square for selected Birla Group of companies under study.

(1) HYDERABAD CEMENT LTD.:-

Table No.-5.19 described that the labour productivity in selected units. It reveals that the output of Hyderabad Cement Ltd. counted to Rs.278.62crores in the base years, which decreased to Rs.269.75crores in 2001-2002. The trend of labour productivity showed fluctuated during the study period. Labour input expanded from Rs.40.53crores to Rs.45.12crores in 2002-2003. The productivity ratio decreased 6.887 to 5.189 in 2000-2001 with average of 6.45. The ratio increased in the last two years. The co-efficient of variance shows 8.779 percent and standard deviation also indicated 8.225 percent, so the trend was fluctuated during the study period.

TABLE NO.-5.19
Analysis of Labour Productivity in Hyderabad Cement Ltd. (In crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	278.62	40.53	6.887	0.58436	100	89.488	0.145
1998-99	271.3	44.47	6.101	0.54044	88.587	91.166	0.163
1999-00	270.33	46.15	5.863	0.52638	85.131	92.844	0.17
2000-01	269.75	46.35	5.189	0.5084	84.492	94.522	0.171
2001-02	319.27	46.52	6.691	0.5783	97.154	96.2	0.149
2002-03	331.68	45.12	7.351	0.60238	106.737	97.878	0.136
TOTAL	**1734.27**	**269.14**	**38.712**	**3.34**	**562.101**	**562.098**	**0.934**
AVE.	**289.045**	**44.85667**	**6.452**	**0.556667**	**93.683**	**93.683**	**0.155667**
STANDARD DEVIATION =			**8.225**	**A=93.68**	**CHI_SQUARE=**		**3.824**
Co-Efficient of Variance			**8.779**	**B=0.839**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Computed value of chi-square describes 3.824 which less than the critical value of 11.07 therefore null hypothesis is accepted and alternative hypothesis is rejected. It means that labour productivity indices follow the trend value.

The straight-line trend showed a positive annual growth of 0.839, which indicates a good growth of labout productivity. Further above table showed the input required per Rupees of output was lowest in 0.136 in 2002-03.

(2) MYSORE CEMENT LTD.:-

Table No.-5.20 described that the labour productivity in Mysore Cement Ltd. It reveals that the output of Mysore amounted to Rs.401.22 crores in 1997-98 which decreased 251.17 crores in 1999-2000. Then from 2000-01 to 2002-03 it showed increased trend. Labour input wherein 1997-98 27.39crores and it was showing the decreasing trend. The labour productivity ratio showed fluctuated trend, which ranged 14.443 in 1999-2000 to 18.371 in 2002-03 with an average of 15.99.showed good labour productivity. The productivity index showed fluctuated trend during the study period. The co-efficient of variance shows 12.35 percent and standard deviation also indicated 12.46 percent. So the trend was fluctuated picture during the study period.

TABLE No.-5.20
Analysis of Labour Productivity in Mysore Cement Ltd.(In crores)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	401.22	27.39	14.648	0.69311	100	102.489	0.0682
1998-99	334.54	22.94	14.853	0.6872	99.55	101.946	0.0685
1999-00	251.17	17.39	14.443	0.6434	98.6	101.403	0.0692
2000-00	358.71	22.3	16.085	0.6947	109.81	100.317	0.0621
2001-02	395.85	22.7	17.438	0.7266	119.04	99.774	0.0573
2002-03	428.94	22.9	18.731	0.7194	78.2	99.237	0.0533
TOTAL	**2170.43**	**135.62**	**95.928**	**4.164**	**605.2**	**605.2**	**0.3786**
AVE.	**361.7383**	**22.603**	**15.988**	**0.694**	**100.867**	**100.867**	**0.0631**
STANDARD DEVIATION =			**12.46**	**A=100.86**	**CHI-SQUARE =**		**9.246**
Co-Efficient of Variance			**12.354**	**B=0.543**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

To test null hypothesis the chi-square is computed which showed the value of 9.246, which is less than the table value of 11.07. So the null hypothesis is accepted and alternative hypothesis is rejected. It means that the L.P. indices follow the trend value. The straight-line trend showed a positive growth of 0.543. Further above table showed the input requirement per rupees of output were lowest in 2002-2003 but 0.0533

(3) SHREE DIGVIJAY CEMENT LTD.:-

TABLE NO.-5.21
Analysis of Labour Productivity in
Shree Digvijay Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	156.86	16.15	9.712	0.17991	100	101.909	0.102
1998-99	204.48	26.39	7.748	0.21823	97.77	102.359	0.129
1999-00	227.67	19.18	11.87	0.21064	122.21	102.809	0.0842
2000-01	174.91	18.74	9.333	0.24648	96.09	103.259	0.1071
2001-02	189.28	22.21	8.522	0.27231	87.742	103.709	0.1173
2002-03	140.1	12.61	11.11	0.18081	114.394	104.159	0.09
TOTAL	**1092.7**	**115.28**	**58.295**	**1.30789**	**618.211**	**618.204**	**0.6296**
AVE.	**182.1167**	**19.21333**	**9.715833**	**0.2179**	**103.0352**	**103.034**	**0.10493**
STANDARD DEVIATION =			**11.699**	**A=103.03**	**CHI_SQUARE =**		**7.864**
Co-Efficient of Variance			**11.354**	**B=0.225**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.21 described that the labour productivity of Shree Digvijay Cement Ltd. It reveals the output of the unit which ranged between 140.10 crores in 2002-2003 to 227.07crores in 1998-99. From the 1997-98 to 1999-2000 it showed increased trend than after it declined. The trend of labour productivity index was showing the fluctuated trend. Labour input expanded from12.61crores in 2002-2003 to 26.39crores in 1998-99. The productivity ratio increased from base year to 1999-2000. Than after it showed declined trend with an average of 9.715. However it ranged between 7.748 in 1997-98 to 11.87 in 1999-2000. The index of labour productivity is also high from the base years 122.21 percent in 1999-2000 to 114.394 percent in 2002-2003. The average index was 103.03 percent with fluctuating trend. And standard deviation was 11.69 percent and co-efficient of co-efficient of variation shows 11.35 percent. Therefore fluctuating traits of trend was found.

The computed value of chi-square was 7.864 which is very less than the table value of 11.07. So null hypothesis is taken in to consideration and alternative hypothesis was not considered. It showed that the trend value was followed by the indices.

The straight-line trend showed a positive growth of 0.225, which does not indicate a good growth of labour productivity. Moreover the lowest input – output ratio was 0.0900 in 002-003 which showed that the input requirements per rupees of output were lowest used in this year

(4) BIRLA CORPORATION LTD.:-

Table No.-5.22 showed labour productivity ratio, co-efficient of co-relationship, productivity index, trend value, input-output ratio, value of chi-square, co-efficient of variation and standard deviation.

TABLE NO.-5.22
Analysis of Labour Productivity in Birla Corporation Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	845.52	104.73	8.073	0.24449	100	94.16	0.123
1998-99	758.22	107.55	7.049	0.269647	87.315	97.074	0.141
1999-00	868.38	107.01	8.114	0.2346	100.507	99.988	0.123
2000-01	876.79	100.41	8.759	0.22615	108.497	102.902	0.114
2001-02	958.55	115.4	8.306	0.237837	102.886	105.816	0.12
2002-03	942.65	106.67	8.837	0.225825	109.463	108.73	0.113
TOTAL	5250.11	641.77	49.138	1.438549	608.668	608.67	0.734
AVE.	**875.0183**	**106.96**	**8.1897**	**0.23975**	**101.445**	**101.445**	**0.12233**
STANDARD DEVIATION =			**7.288**	**A=101.44**	**CHI_SQUARE =**		**1.736**
Co-Efficient of Variance			**7.1849**	**B= 1.457**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

From above Table No.-5.22 it describe that the output value of Birla Corporation Ltd. amounted to 845.52crores in the base years which was after showing constant upward trend finally increased to Rs. 958.55 crores in 2001-2002. But in the last years it declined to 952.65. On the labour input recorded showed fluctuated trend and expanded from 104.73 crores in 1997-98 to 106.67crores in 2002-2003. The labour productivity ratio has been fluctuating during the period of study ranging from a low of 7.049 in 1998-1999 to a high 8.114 in 1999-2000 with an average of 8.18.

After zigzag movement of labour productivity ratio it may also be observed from the indices, which showed average of 101.44. The overall performance of Birla corporation ltd.in regard to labour productivity satisfactory as it observed from the average of labour productivity indices. Co-efficient of variation showed 7.18 while standard deviation figured by 7.288. The input requirement during the period ranged between Rs.0.123 in the base year to 0.141 in 1998-99. In order to test hypothesis based on chi-squre, the calculated value was found 1.736 where as its table value was 11.07. It means that null hypothesis is accepted and alternative hypothesis is rejected. It means that the L.P indices follow the trend value.

(5) CENTURY TEXTILES MILLS:-

Table No.-5.23 describe that labour productivity, co-efficiency of relationship, productivity index, trend value input-output ratio, standard deviation, co-efficient of variation and value of chi-square.

It was apparent from the table that the labour productivity of century textile mills fluctuated through out the period of the study. The output of century textile amounted to 1933.86crores in 1997-98 which is increased Rs. 2243.10crores in 2001-2002. On the other hand the labour input expanded from Rs.225.36crores in 1997-98 to Rs.275.75crores in 2002-2003. The productivity ratio ranged between 7.906 in 1998-99 to 8.581 in 1997-98. Similarly the productivity index also fluctuate the average of the indices 96.92 percent shows declining trend in labour productivity.

The straight line based on trend value showed a negative growth rate of 0.556 per annum which indices a poor pattern of labour productivity. It may also be seen from the table that the average labour input per rupees of output for textiles amounted to Rs.0.1198. Input-output ratio was the lowest in 0.116 in 1997-98. It showed that the company achieved its maximum efficiency in that year.

TABLE NO.-5.23

Analysis of Labour Productivity in Century Textile Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1933.86	225.36	8.581	0.632164	100	101.833	0.116
1998-99	1943.6	245.81	7.906	0.615179	92.133	99.871	0.126
1999-00	2149.94	253.56	8.478	0.62976	98.799	97.909	0.117
2000-01	2211.94	267.09	8.281	0.6419	96.503	95.947	0.12
2001-02	2243.1	262.89	8.532	0.63555	99.428	93.985	0.117
2002-03	2241.17	275.75	8.127	0.61942	94.709	92.023	0.123
TOTAL	**12723.56**	**1530.46**	**49.905**	**3.77397**	**581.572**	**581.568**	**0.719**
AVE.	**2120.5933**	**255.077**	**8.3175**	**0.628995**	**96.9286**	**96.9286**	**0.1198**
STANDARD DEVIATION =			**2.807**	**A=96.928**	**CHI_SQUARE =**		**1.037**
Co-Efficient of Variance			**2.896**	**B=--0.098**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The value of chi-square showed 1.037, which is less than the table value 11.07. Therefore the null hypothesis is accepted and alternative hypothesis is rejected.

(6) KESORAM MILLS LTD.:-

Table No.-5.24 describe that labour productivity ratio, co-efficiency of co-relationship, productivity index, Trend value, Input-output ratio, standard deviation, co-efficient of variation and value of chi-square.

It is apparent from the table that the labour productivity of Kesoram Mills Ltd. fluctuated throughout the period of study. The output of Kesoram Mills Ltd. amounted to Rs.3499.84crores in 1997-98 which is decreased to Rs.608.34crores in 1999-2000. Then it was increased Rs.1116.38crores in 2000-01 to 1159.04crores in 2002-03. On the other hand the labour input expanded from Rs.669.20crores in 1997-98 to 108.88crores in 2002-2003. The productivity ratio ranged between 8.663 in 1998-99 to 13.227 in 2000-2001. Similarly the productivity index also fluctuated. The average of the indices 113.94 shows increased trend in labour productivity.

TABLE NO.-5.24

Analysis of Labour Productivity in Kesoram Mills Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	640.22	69.2	9.251	0.63804	100	98.919	0.108
1998-99	615.9	71.09	8.663	0.626605	93.643	104.931	0.115
1999-00	608.34	62.18	9.783	0.645108	105.75	110.943	0.102
2000-01	1116.38	84.4	13.227	0.701974	142.979	116.955	0.0756
2001-02	1122.47	96.02	11.68	0.68234	126.256	122.967	0.0855
2002-03	1159.04	108.88	10.645	0.64468	115.068	128.979	0.0939
TOTAL	**5262.35**	**491.77**	**63.247**	**3.938747**	**683.696**	**683.694**	**0.58**
AVE.	**877.0583**	**81.96167**	**10.541**	**0.656458**	**113.949**	**113.949**	**0.096667**
STANDARD DEVIATION =			**16.68**	**A=113.94**	**CHI_SQUARE =**		**8.848**
Co-Efficient of Variance			**14.64**	**B=3.006**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The strait line based on trend value showed a positive growth of 3.006 per annum which indicates a good pattern of labour productivity.

It may also be seen from the table that the average labour input per rupees of output for Kesoram Mills Ltd. amounted to Rs. 0.0966. Input-output ratio was the lowest in 0.0756 in 2000-2001. It showed that the company achieved its maximum efficiency on that year.

The value of chi-square showed 8.848, which is less than the table value of 11.07. Hence the null hypothesis is accepted and alternative hypothesis is rejected.

(7) INDIAN RAYON IND. LTD.:-

Table No.-5.25 describe that the labour productivity in selected Birla Group of companies. It reveals that the output of Grasim counted to Rs. 1528.25 crores in 1997-98. This was decreased to 1072.09 in 1999-2000. The trend of labour productivity showed fluctuated during the period of study. In case of labour input it expanded from Rs.102.91crores to Rs.112.08crores in 2002-2003. The productivity ratio decreased from base years 1997-98 in 15.375 to 11.826 in 2002-2003 of the research study with an average of 11.92, the impact of productivity ratio shown productivity index. It also decreased

100 to 79.216 with average of 77.58.The co-efficient of variance shows 14.014 percent.

TABLE NO.-5.25
Analysis of Labour Productivity Ratio in Indian Rayon Ind. Ltd.(IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1582.25	102.91	15.375	0.90884	100	86.154	0.065
1998-99	1299.03	109.57	11.855	0.83395	77.105	82.728	0.0846
1999-00	1072.09	107.99	9.927	0.62349	64.565	79.302	0.1
2000-01	1416.19	118.13	11.488	0.78529	74.718	75.876	0.0834
2001-02	1410.63	127.01	11.106	0.77349	72.234	72.45	0.09
2002-03	1443.82	122.08	11.826	0.78797	76.917	69.024	0.0845
TOTAL	**8224.01**	**687.69**	**71.577**	**4.713**	**465.539**	**465.534**	**0.5074**
AVE.	**1370.668**	**1370.668**	**11.9295**	**0.7855**	**77.589**	**77.589**	**0.084567**
STANDARD DEVIATION =			**10.87**	**A=77.59**	**CHI_SQUARE =**		**6.267**
Co-Efficient of variance			**14.014**	**B=-1.713**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Computed chi-square value highlights 6.267 which is less than the table value of 11.07. Hence null hypothesis is accepted and alternative hypothesis is rejected. It means that the labour productivity indices can be approximated by the least square straight-line trend. The straight-line trend showed negative annual growth by 1.713 of labour productivity, further above table showed the input requirement per rupees of output were lowest in 1997-98 at figured 0.065

(8) HINDUSTAN MOTOR LTD:-

Table No.-5.26 showed labour productivity ratio, Coefficient of co-relationship, productivity index, trend value, input output value ratio, value of chi-square, co-efficient of variation, and standard deviation.

From above table it showed that the output value of Hindustan Motor Ltd. counted to 1003.27crores in 1997-98 which was after showing mix trend

finally decreased to 792.22crores in 2002-03. The output has been fluctuating during this period ranging from the lowest of 692.66 in 2001-02 to highest 1330.81 in 1999-2000.

TABLE NO.-5.26
Analysis of Labour Productivity Ratio in Hindustan Motor Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1003.27	139.56	7.188	0.5376	100	114.033	0.139
1998-99	1217.58	146.63	8.303	0.548	115.511	109.811	0.1204
1999-00	1330.81	150.13	8.864	0.08594	123.316	105.589	0.112
2000-01	1233.28	156.26	7.892	0.52911	109.794	101.367	0.1267
2001-02	692.66	129.39	5.353	0.4499	74.471	97.145	0.186
2002-03	**792.22**	**112.71**	**7.028**	**0.5044**	**97.774**	92.923	**0.142**
TOTAL	**6269.82**	**834.68**	**44.628**	**2.6549**	**620.866**	**620.868**	**0.8261**
AVE.	**1044.97**	**139.1133**	**7.438**	**0.442**	**103.478**	**103.478**	**0.13768**
STANDARD DEVIATION =			**15.6219**	**A=103.48**	**CHI_SQUARE =**		**11.245**
Co-Efficient of Variance			**15.096**	**B=-2.111**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

On the other hand labour productivity input recorded fluctuating it expanded from 139.56crores in the base year to 112.71 crores in 2002-03. The labour productivity ratio has been fluctuating during the period of study ranging a low of 7.028 in 2002-2003 to a high of 8.864 crores in 1998-99 with an average of 7.43. The value of chi-square figured at 11.245, which is less than the table of 11.07. Therefore null hypothesis is rejected and alternative hypothesis is accepted.

After succession of straight lines with abrupt alternate right and left turn movement of labour productivity ratio it may also be observed from the indices which showed average of 103.47. The overall performance of H.M.L. with regard to labour productivity can be said satisfactory as is observed from the average of labour productivity indices. Co-efficient of variation showed 15.096 while standard deviation describe by figured 15.62. The input requirement during the period ranged between Rs.0.112 to Rs. 0.186 the

requirement per rupees of output the lowest in 1999-2000 which showed that the company achieved its maximum efficiency in that year.

(9) HINDALCO LTD.:-

The table no.-5.27 showed the labour productivity in Hindalco Ltd. It reveals that the output of Hindalco amounted Rs.1474.27crores in the base years, which increased to Rs. 4980.90 crores in 2002-2003. The labour input also showed a good direction towards progress labour input expanded from 98.64 crores to 223.84 crores in 2002-2003. The productivity ratio fluctuated slightly from 1997-98 to 1999-2000 but then after it declined it ranged between 13.955 in 001-002 to 22.252 in 2002-2003. In the last years it increased. The labour productivity index 100 for 1997-98 went on 148.892 in 2002-2003.

TABLE NO.-5.27
Analysis of Labour Productivity Ratio in Hindalco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1474.27	98.64	14.945	0.96262	100	89.794	0.0669
1998-99	1768.1	119.2	14.833	0.96837	99.25	96.386	0.0674
1999-00	2032.43	140.85	14.365	0.79948	96.119	102.978	0.0693
2000-01	2276.65	152.32	14.946	0.9872	100.006	109.57	0.0669
2001-02	2332.98	167.17	13.955	0.92174	93.375	116.162	0.0716
2002-03	4980.9	223.84	22.252	0.90969	148.892	122.754	0.0449
TOTAL	**14865.33**	**902.02**	**95.296**	**5.5491**	**637.642**	**637.644**	**0.387**
AVE.	**2477.555**	**150.3367**	**15.88267**	**0.92485**	**106.274**	**106.274**	**0.0645**
STANDARD DEVIATION =			**19.2**	**A=106.27**	**CHI_SQUARE =**		**12.572**
Co-Efficient of Variance			**18.075**	**B=3.296**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The average of indices worked out at 106.28 percent with a co-efficient of variation of 18.075 percent. The value of chi-square shows 12.572. It is more than the table value. Therefore null is rejected accepted and alternative hypothesis is accepted

The computed value of productivity indices showed a positive growth 3.296 per year resulting in upward trend. The input requirement during the period ranged 0.0449 to 0.0716 per rupees of output with an average of 0.0645 per rupees. Input-out ratio was the lowest in 2002-2003 its shows that above company achieved its maximum efficiency in that year.

(10) TEXMACO LTD.:-

Labour productivity, its growth, its trend value and direction of labour indices for Texmaco was shown in table no.- 5.28.

TABLE NO.-5.28
Analysis of Labour Productivity Ratio in Texmaxco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	246.62	35.76	6.896	0.51628	100	82.546	0.145
1998-99	182.79	40.74	4.486	0.37959	65.02	77.398	0.222
1999-00	133.65	32.51	4.111	0.37798	59.614	72.25	0.243
2000-01	140.52	29.1	4.828	0.437316	70.011	67.102	0.207
2001-02	95.85	30.01	3.193	0.25837	56.302	61.954	0.313
2002-03	**124.36**	**26.87**	**4.628**	**0.37907**	**67.11**	56.806	**0.216**
TOTAL	**923.79**	**194.99**	**28.142**	**2.348606**	**408.09**	**418.056**	**1.346**
AVE.	**153.965**	**32.49833**	**4.690333**	**0.391434**	**69.676**	**69.676**	**0.22433**
STANDARD DEVIATION =		**16.22062**	**A=68.015**	**CHI_SQUARE =**			**10.39**
Co-Efficient of Variance		**23.848**	**B=-2.274**				

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The overall performance of above unit as shown in the table can be regarded as poor. It shows in the average of labour productivity indices 68.015 over the base years. Further table reveals that the output of above unit amounted to Rs.246.62crores in 1997-98, which after decreased to 124.36 in the last years of period of study. On the other hand the labour input expanded from 35.76crores in 1997-98 to 26.87crores in 2002-2003.The labour productivity ratio ranged between 3.193 in 2000-2001 to 6.896 in 1997-98

with the average of 4.69. The average indices decreased which showed poor position of the unit.

The straight line based on trend value showed a down ward trend with a negative rate of 2.274 per annum. It indicates that the poor position. The co-efficient of variance remained at 16.22 the value of chi-square remained at 10.39, which is more than the table value of 11.07. Hence null hypothesis is accepted and alternative hypothesis is rejected. The labour input require per rupees of output ranged between 0.145 and .0313 for the unit.

(11) BIRLA POWER & SOLUTION LTD:-

Table No.-5.29 showed labour productivity ratio, Co-efficient of co-relationship, productivity index, trend value, input-output ratio, value of chi-square, co-effiecint of variation, and standard deviation.

TABLE NO.-5.29
Analysis of Labour Productivity Ratio in Birla Power and Solution Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				Factor	index	value	
1997-98	65.7	5.35	12.28	0.79808	100	90.91	0.081
1998-99	62.86	6.4	9.821	0.7169	79.975	84.504	0.102
1999-00	61.32	6.92	9.005	0.15523	73.33	78.098	0.113
2000-01	65.29	8.17	7.991	0.61055	65.073	71.692	0.125
2001-02	69.35	8.62	8.045	0.61805	65.513	65.286	0.124
2002-03	71.17	8.85	8.041	0.58832	65.48	58.88	0.124
TOTAL	**395.69**	**44.31**	**55.183**	**3.4871**	**449.371**	**449.37**	0.67
AVE.	**65.948**	**7.385**	**9.1972**	**0.58118**	**74.895**	**74.895**	**0.112**
STANDARD DEVIATION =			**12.46**	**A=74.895**	**Chi-Square**		**2.794**
Co-Efficient of Variance			**16.637**	**B=--3.20**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

From the above table it showed that the output value of Birla Power & Solution Ltd. counted to Rs.65.70crores in the base year, which decreased to 61.32 crores in 1998-99. Then after it showed increase trend. The output has been fluctuating during this period ranging from lowest of 61.32 crores for the 1999-2000 to highest 71.17 crores in 2002-2003. On the other hand labour

input recorded progress it expanded from 5.35 crores in 1997-98 to 8.85 crores in 2002-03.

The labour productivity ratio has been fluctuating during the period of study ranging from a low 7.991 in 1999-2000 to a high of 12.280 in 1997-98 with an average of 9.197. The value of chi-square figured at 2.794, which is less than the critical value of 11.07, so null hypothesis, is accepted and alternative hypothesis is rejected.

The labour productivity indices showed fluctuated movement, which decreased. The average of labour productivity 74.89 which can't be considered satisfactory. Co-efficient of variation showed 16.63 while standard deviation described by figured 12.46. The input requirement during the period ranged between Rs.0.00841 to 0.125. The input requirement per rupees of output the lowest in 1997-98, which showed that the company achieved its maximum efficiency.

(12) BIRLA V.X.L. LTD.:-

Table No.-5.30
Analysis of Labour Productivity Ratio in Birla V.X.L. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	482.9	52.74	9.156	0.67349	100	98.318	0.109
1998-99	583.23	68.65	8.495	0.6667	92.78	91.628	0.117
1999-00	251.21	31.55	7.993	0.64923	87.297	84.938	0.125
2000-01	335.28	54.2	6.185	0.51568	68.551	78.248	0.161
2001-02	230.46	35.5	6.491	0.57368	70.893	71.558	0.154
2002-03	**232.54**	**36.26**	**6.143**	**0.59211**	**70.041**	**64.868**	**0.1554**
TOTAL	**2115.6**	**278.9**	**44.733**	**3.0972**	489.562	**489.558**	**0.8214**
AVE.	**352.6**	**46.4833**	**7.4555**	**0.5162**	**81.593**	**81.593**	**0.1369**
STANDARD DEVIATION =			**12.53**	**A=81.43**	**CHI_SQUARE =**		**1.729**
Co-Efficient of Variance			**15.385**	**B=-3.345**			

SOURCES:-COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.30 showed that labour productivity, Its growth as indicated by its trend value and direction of labour indices for Birla V.X.L Ltd. The over all performance of Birla V.X.L. Ltd. with regard to labour productivity

can' t be satisfactory as is observed from the average of labour productivity indices. The input requirement during the period ranged between Rs.31.55crores in 1999-2000 to 68.65 crores in 1998-99. The input requirement per rupees of output the lowest in 1999-2000, which describe that the company was, achieved its maximum efficiency in that year.

Computed chi-square value describes 1.729 percent which is less than the critical value of 11.07. Therefore the null hypothesis is accepted and alternative hypothesis is rejected. It means that productivity index do not follow the trend value.

(13) JAYSHREE TEA & IND. LTD.:-

Table No.-5.31 described that the labour productivity in selected units.

TABLE NO.-5.31
Analysis of Labour Productivity Ratio in Jayshree Tea & Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	211.42	53.37	3.961	0.438	100	94.842	0.2524
1998-99	203.48	59.3	3.431	0.35951	86.619	86.32	0.2914
1999-00	190.94	64.11	2.978	0.33073	75.183	77.798	0.3357
2000-01	159.72	64.71	2.468	0.27109	62.307	69.276	0.4051
2001-02	144.55	65.62	2.202	0.231209	55.592	60.754	0.4539
2002-03	156.59	64.25	2.437	0.26738	61.524	52.232	0.4103
TOTAL	**106.7**	**371.36**	**17.477**	**1.89791**	**441.225**	**441.222**	**2.1488**
AVE.	**17.78333**	**61.89333**	**2.91283**	**0.316318**	**73.537**	**73.537**	**0.35813**
STANDARD DEVIATION =			**15.634**	**A=73.537**	**CHI_SQUARE =**		**3.162**
Co-Efficiency of Variacne			**21.26**	**B=--4.261**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Above table reveals that the output of Jay Shree Tea & Ind. Ltd. counted Rs.211.42crores in the base year which decreased to Rs.144.55crores in 2001-2002. But then it slightly increased to 156.56crores. The trend was fluctuated throughout the years. The input expanded from 53.37crores to Rs.64.25crores in 2002-2003. The productivity ratio decreased 3.961 to 2.437 with an average of 2.91.

The impact of productivity ratio showed in productivity index it also decreased 100 to 61.524 with overall average of 73.53 percent and standard deviation also indicated 21.26 so fluctuating trend was there during the study period. In case of chi-square it showed 1.37, which is less than the table value of 11.07 it means that null hypothesis is accepted and alternative hypothesis is rejected. It reveals that the output of above unit is amounted to 482.90 crores which then after increased to 583.23 crores in 1998-99 after this year the output showed decreased trend. It ranged between 232.54 in 2002-2003 to 583.23 crores in 1998-99. On the other hand the labour input also decreased. The impact of labour productivity ratio was shown in the productivity index. Co-efficient of variation of 15.38 percent gives the comparative picture.

The straight-line trend showed a negative growth of 4.261, which indicates poor growth of labour productivity. Further above table showed the input requirement per rupees of output were lowest in 0.2524.

(14) ZUARI AGRO IND. LTD:

TABLE NO.-5.32
Analysis of Labour Productivity Ratio in
Zuari Agro Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	928.59	34.22	27.135	0.89255	100	107.367	0.0368
1998-99	834.79	30.71	27.183	0.93567	100.178	105.049	0.0367
1999-00	1322.07	44.92	29.431	0.81065	108.461	102.731	0.0339
2000-01	1210.11	38.69	31.116	0.9379	114.671	100.413	0.0321
2001-02	1228.86	41.65	29.504	0.85231	108.73	98.095	0.0338
2002-03	1041.83	49.61	21	0.72815	77.39	95.777	0.0476
TOTAL	**6566.25**	**240**	**165.269**	**5.15723**	**609.428**	**609.432**	**0.2209**
AVE.	**1094.375**	**40**	**27.54483**	**0.859538**	**101.572**	**101.572**	**0.03682**
STANDARD DEVIATION=			**11.968**	**A=101.571**	**CHI_SQUARE =**		**7.758**
Co-Efficient of Variance			**11.783**	**B=--1.169**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.32 showed labour productivity ratio, co-efficient of co-relationship, productivity index, trend value, Input-output ratio, Value of chi-square, co-effiecint of variation, and standard deviation. From above table it

describe that the output value of Zuari Ltd. amounted to Rs. 928.59 crores in 1997-98 which was after showing upward trend finally in the last year it decreased compared to base year. On the other hand labour input recorded progress and expanded from 34.22 crores in 1997-98 to 49.62 crores in 2002-03. The labour productivity ratio has been fluctuating during the period of study ranging from a low of 21 in 2002-2003 to a high of 31.116 in 1999-2000 with an average of 27.54 After zigzag movement of labour productivity ratio it may also be observed from indices, which showed average of 101.57. The overall performance of Zuari in regard to labour productivity can be said satisfactory as it observed from the average of labour productivity indices. Co-efficient of variation showed 11.78 while standard deviation figured by 11.968.

The input requirement during the period ranged Rs.0.0321 to 0.0478. The input requirement per rupees of output was the lowest in1999-2000. In order to test hypothesis based on chi-square, the calculated was found 7.758 whereas its tale value was 11.07. It means that null hypothesis is accepted.

(15) ORIENT PAPER LTD.:-

Table No.-5.33 showed labour productivity ratio, Co-efficient of co-relationship, productivity index, trend value, Input-output ratio, Value of chi-square, Co-effiecint of variation, and standard deviation.

It is apparent from the table that the labour productivity of Orient Paper Ltd. fluctuated throughout the period of study. The output of Orient Paper Ltd. amounted Rs.555.75crores in 1997-98 which decreased in 1998-99, but then after it showed increased trend to Rs.589.22crores in 2002-2003. On the other hand the labour input expanded from Rs.54.35crores in 1997-98 to Rs.62.25crores in 1999-2000 then after in the last year it was 57.09 crores. The productivity ratio ranged between 7.973 in 1999-2000 to 10.32 in 2002-2003. Similarly the productivity index also fluctuating the average of the indices 91.49 shows declining trend in labour productivity.

TABLE NO.-5.33
Analysis of Labour Productivity Ratio in Orient Paper Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	555.75	54.34	10.227	0.63625	100	86.801	0.0977
1998-99	546.37	64.44	8.4787	0.60521	82.898	88.677	0.0179
1999-00	488.79	61.25	7.973	0.56017	77.96	90.553	0.1253
2000-01	551.91	62.13	8.883	0.57947	86.858	92.429	0.1125
2001-02	583.71	56.89	10.26	0.66378	100.322	94.305	0.0974
2002-03	589.22	57.09	10.32	0.64886	100.909	96.181	0.0968
TOTAL	**3315.75**	**356.14**	**56.141**	**3.68999**	**548.947**	**548.946**	**0.6476**
AVE.	**552.625**	**59.3567**	**9.35683**	**0.614998**	**91.491**	**91.491**	**0.107933**
STANDARD DEVIATION =			**9.335**	**A=91.491**	**CHI_SQUARE =**		**5.087**
Co-Efficient of Variance			**10.2038**	**B=0.938**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The straight line based on trend value showed a positive growth rate of 1.66 per annum, which indicates a poor pattern of labour productivity. It may also be seen from the table the average labour input per rupees of output for Orient Paper Ltd. amounted to 0.107. Input-out ratio was the lowest in 0.0179 in 1998-99. It showed that the company achieved its maximum efficiency in that year.

The value of chi-square showed 5.087 which less than the tables value of 11.07 hence the null hypothesis is accepted. It is concluded that the trend value is followed by labour productivity indices.

(16) GRASIM LTD:-

Table No.-5.34 described that the labour productivity in selected Birla group of companies. It reveals that the output of Grasim Ltd. counted to 3499.84crores in 1997-98 which was in increased to 4609crores in 2002-2003. The trend of labour productivity showed fluctuating during the period of study. In the case of Labour input it expanded from 234.48crores to 322.87 crores in 2001-02. The productivity ratio showed fluctuated trend with an average of 14.27.the impact of productivity ratio shown in productivity index.

It also decreased 100 to 94.22 except in 1999-2000 (103.356), 94.22 in 2002-2003. The co-efficient of variation shows 4.918 percent

TABLE NO.-5.34
Analysis of Labour Productivity Ratio in Grasim Mills Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	3499.84	234.48	14.925	0.80625	100	97.68	0.0669
1998-99	3756.87	264.9	14.182	0.77296	95.021	96.854	0.0705
1999-00	4272.62	316.68	13.491	0.76554	90.391	96.028	0.0741
2000-01	4821.71	312.57	15.426	0.8535	103.356	95.202	0.0648
2001-02	4372	322.87	13.541	0.78586	90.726	94.376	0.0669
2002-03	4609	327.82	14.059	0.76864	94.197	93.55	0.0711
TOTAL	**25332**	**1779.32**	**85.624**	**4.75275**	**573.691**	**573.69**	**0.4143**
AVE.	**4222**	**296.553**	**14.27067**	**0.792125**	**95.615**	**95.615**	**0.06905**
STANDARD DEVIATION =			**4.702**	**A=95.615**	**CHI_SQUARE =**		**1.264**
Co-Efficient of Variance			**4.918**	**B=--0.413**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The computed chi-square value highlights 1.264 which is less than the table value of 11.07. Hence null hypothesis is accepted labour productivity indices can be approximately by least square straight-line trend. The straight-line trend showed negative annual growth by 0.413 of labour productivity, further above table showed the input requirement per rupees of output was lowest in 2000-01 at figured 0.0648 .

HYPOTHESI BASED ON KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIATION TEST:

Null hypothesis:-There is no significant different between the labour productivity ratio of Birla Group of companies.

Alternative hypothesis: -There is significant different between the labour productivity of the Birla Group of companies.

Level of significant:-5 percent

Statistical tool used:- kruskal Wallis,

Critical value: -24.99

LABOUR PRODUCTIVITY RATIOS OF SELECTED BIRLA GROUP OF COMPANIES AND KRUSKAL WALLIS ONE WAY ANALYSIS OF VARIANCE TEST:

Kruskal Wallis test is use fuel measurement tool for to test the null hypothesis that 'K' independent random samples come from identical universes against the alternative hypothesis. It indicates that the universe is not equal.

TABLE NO.-5.35
COMPARATIVE LABOUR PRODUCTIVITY RATIOS OF SELECTED COMPANIES WITH KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIANCE

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	6.887	**20**	14.648	**79**	9.712	**55**	8.073	**34**	8.581	**45**	9.251	**53**	15.375	**85**	7.19	**24**
1998-99	6.101	**15**	14.853	**81**	7.748	**26**	7.049	**23**	7.906	**28**	8.663	**46**	11.855	**68**	8.3	**38**
1999-00	5.863	**14**	14.443	**78**	11.87	**69**	8.114	**35**	8.478	**40**	9.783	**56**	9.927	**58**	8.86	**49**
2000-01	5.189	**12**	16.085	**87**	9.333	**54**	8.759	**47**	8.281	**37**	13.23	**71**	11.488	**65**	7.89	**27**
2001-02	6.691	**19**	17.438	**88**	8.522	**43**	8.306	**39**	8.532	**44**	11.68	**66**	11.106	**63**	5.35	**13**
2002-03	7.351	**25**	18.731	**89**	11.11	**64**	8.837	**48**	8.127	**36**	10.65	**62**	**11.826**	**67**	**7.03**	**22**
Total Rank		**105**		**502**		**311**		**226**		**230**		**354**		**406**		**173**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
14.95	**83**	6.896	**21**	12.28	**70**	9.156	**52**	3.961	**7**	27.14	**92**	10.227	**59**	14.9	**82**
14.83	**80**	4.486	**9**	9.821	**57**	8.495	**42**	3.431	**6**	27.18	**93**	8.4787	**40**	14.2	**76**
14.37	**77**	4.111	**8**	9.005	**51**	7.993	**31**	2.978	**4**	29.43	**94**	7.973	**29**	13.5	**72**
14.95	**84**	4.828	**11**	7.991	**30**	6.185	**17**	2.468	**3**	31.12	**96**	8.883	**50**	15.4	**86**
13.96	**74**	3.193	**5**	8.045	**33**	6.491	**18.5**	2.202	**1**	29.5	**95**	10.26	**60**	13.5	**73**
22.25	**91**	**4.628**	**10**	8.041	**32**	**6.143**	**15**	2.437	**2**	21	**90**	10.32	**61**	**14.1**	**75**
	489		**64**		**273**		**176**		**23**		**560**		**299**		**464**

The comparative position of labour productivity ratios of the selected Birla group of companies have been discussed in table and with the application of Kruskal Wallis one way analysis of variance test on this ratio

$$H = \frac{12}{N(n+1)} \sum^{K} \frac{Ri1}{Ni} - 3(n+1)$$

$$\sum_{I=1}$$

Where n =n1+n2+n3..nk and Ri=sum of the rank

$$K = \frac{12}{96(96+1)}\left[\frac{(105)^2}{6}+\frac{(502)^2}{6}+\frac{(311)^2}{6}+\frac{(226)^2}{6}+\frac{(230)^2}{6}\right.$$

$$\frac{(354)^2}{6}+\frac{(406)^2}{6}+\frac{(173)^2}{6}+\frac{(489)^2}{6}+\frac{(64)^2}{6}$$

$$\left.\frac{(273)^2}{6}+\frac{(176)^2}{6}+\frac{(23)^2}{6}+\frac{(560)^2}{6}+\frac{(299)^2}{6}+\frac{(464)^2}{6}\right] -3(96+1)$$

= 0.00128865 (291863.21) –291

= 376.11 -291

= 85.11

Table No.-5.35 describe that the calculation value of ' H' equals to 85.11 which is more than the table value of 24.996hence the null hypothesis based on Kruskal Wallis one way analysis of variance test at 5 percent level of significant is Rejected. The acceptations of alternative hypothesis and rejection of null hypothesis described there is significant different between the labour production ratios of the selected companies.

COMPARATIVE ANALYSIS OF LABOUR PRODUCTIVITY:-

The Table No.-5.36 showed the overall analysis of Labour productivity of Birla group of companies. It also Showed labour productivity ratio, Co-efficient of co-relationship, productivity index, trend value, input-output ratio, value of chi-square, co-efficient of variation, and standard deviation.

TABLE NO.-5.36
COMPARATIVE ANALYSIS OF LABOUR PRODUCTIVITY

	OUTPUT -INPUT		PROD. INDEX		CO-IFF.		CHI-SQUARE		INPUT-OUTPUT		GROWTH		OVER ALL	
	AVE.		AVE.						AVE.		Rate		AVE.	
COMPANY	VAL	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK	VAL	RNK	VAL.	RNK	VAL.	RNK
CEMENT														
HYD.	6.452	14	93.68	10	8.779	12	3.82	10	0.155	3	1.31	14	63	2

MYSORE	15.99	2	100.9	7	12.35	9	9.25	4	0.063	14	0.54	2	38	14
SHREE DIG.	9.715	7	103	4	7	14	7.86	6	0.104	9	-0.11	7	47	11
BIRLA COR.	8.189	11	101.4	6	7.184	13	1.74	13	0.122	6	2.41	11	60	4.5
TEXTILES														
CENTURY TEX.	8.315	10	96.92	9	2.894	16	1.04	16	0.029	16	-0.1	10	77	1
KESORAM.	10.54	6	113.9	1	14.64	7	8.85	5	0.096	10	3.01	6	35	15
INDIA RAYON	11.93	5	77.59	13	14.01	8	6.27	8	0.085	11	-1.7	5	50	10
AUTO														
H.M.T.	7.438	13	103.5	3	15.1	6	11.2	2	0.138	4	-2.1	13	41	12
HINDALCO	15.88	3	106.3	2	18.08	3	12.6	1	0.065	13	3.3	3	25	16
ENGINEERING														
TEXMACO LTD.	4.69	15	68.02	16	23.85	1	10.4	3	0.224	2	-2.3	15	52	9
B.P.&S	9.197	9	74.9	14	16.64	4	2.79	12	0.111	7	-3.2	9	55	7
WOOL														
BIRLA VXL	7.455	12	81.43	12	15.39	5	1.73	14	0.137	5	-3.3	12	60	4.5
TEA INDUSTY														
JAYSHREE TEA	2.912	16	73.54	15	21.26	2	3.16	11	0.358	1	-4.3	16	61	3
AGRO-IND														
ZUARI	27.54	1	101.6	5	11.78	10	7.76	7	0.037	15	-1.2	1	39	13
PAPER														
PAPER	9.356	8	91.49	11	10.2	11	5.09	8	0.107	8	0.94	8	54	8
DIVERSIFIED														
GRM	14.27	4	95.62	9	4.918	15	1.26	15	0.069	12	-0.4	4	59	6
BIRLA GROUP	**10.62**		**92.74**		**12.75**		**5.926**		**0.119**		**-0.45**		**51**	

OVERHEADS PRODUCTIVITY:-

"Overheads costs are the operating costs of a business enterprise, which can be traced directly to a particular unit of output. The term 'Overheads' is used interchangeably with such terms as burden, supplementary costs, manufacturing expenses, and indirect expenses"

The major part of total cost including total ovrheads, office overheads, selling and distribution overheads, thus primary aim of accounting for overhead is to controlling. Present study outlined output in constant prices divided by total overheads input it gives overheads productivity ratio. The

productivity ratio indices, Co-efficiency of co-relationship, input output ratio etc.

STEPS IN ACCOUNTING FOR OVERHEADS PRODUCTIVITY:-

HYPOTHESIS:-

For the computation of overhead productivity following two hypothesis have been tested with two corresponding alternative hypothesis. The first hypothesis is shown whether the overhead productivity indices can be approximately as straight-line trend while the second hypothesis is whether there is any significant difference between the overheads productivity of the selected Birla Group of Companies. The hypothesis has been framed as under.

HYPOTHESIS BASED ON CHI-SQUARE: -

Null hypothesis:- The overhead productivity indices can be represented by the line of the best fit.

Alternative hypothesis: -The indices can' t be represented by the line of the best fit.

Level of significant: - 5 percent

Statistical tool used: - chi-square

Critical value: - 11.07

If the found of chi-square is less than the critical value, the null hypothesis will be accepted. While value of chi-square is shown greater than the table value null hypothesis will be rejected and its alternative hypothesis is accepted. The acceptance of null hypothesis would mean that the calculated value of the indices is based on least square straight-line trend. It may represent the pattern and growth of the overhead productivity. Since no logical conclusions can be drawn from the original indices which are generally fluctuating with its negative or positive growth rate per year expressing the direction of productivity growth.

HYPOTHESIS BASED ON KRUSKAL WALLIS ONE WAY ANALYSIS OF VARIATION TEST: -

Null hypothesis: - There is no significant difference between the overheads productivity ratios of selected Birla group of companies.

Alternative hypothesis:- There is significant difference between the overhead productivity of the Birla group of companies.

Level of significant: - 5 percent

Statistical tools used: - kruskal Wallis.

Critical value: - 24.996

The acceptance of null hypothesis would mean that there is no significance difference between productivity of selected Birla Group of companies. The rejection of null hypothesis and acceptance of its alternative hypothesis would mean that there is significant different between the overhead productivity ratios of the selected Birla group of companies.

OVERHEAD PRODUCTIVITY IN SELECTED UNITS OF BIRLA GROUP OF COMPANIES: -

Table 5.37 to 5.58 describes the overhead productivity ratio and index of labour productivity, average of labour indices, co-efficiency of variation, and value of chi-square for selected companies under study.

(1) HYDERABAD CEMENT LTD:-

Table No.-5.37 gave the details of overheads productivity ratio, indices, co-efficiency of co-relationship, input-output ratio as well as chi-square test for Hyderabad Cement Ltd.

As shown in the table that value of output of Hyderabad Cement Ltd. was increasing over the period. The output of Hyderabad Cement Ltd. was Rs.278.62crores in 1997-98 and increased to Rs.331.61crores in 2002-2003. While the overhead input grew from Rs.69 crores in 1997-98 to 102.88 crores. Due to speedy rise in the input in comparison to the output, the overhead productivity ratio also influenced. It showed highest figured at 4.0379 in 1997-98 to and minimum figured at 3.0810 in 1999-2000.overhead productivity

indices remained fluctuating during the period of study. The overall productivity index showed down ward direction the average index works out to 84.08 with co-efficient of variation being 8.949 percent

TABLE NO.-5.37
Analysis of Overhead Productivity Ratio in Hyderabad Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	278.62	69	4.0379	0.34261	100	92.272	0.2476
1998-99	271.33	79.84	3.396	0.3008	84.155	89.016	0.2944
1999-00	270.61	81.35	3.326	0.29861	82.619	85.76	0.3015
2000-01	269.75	87.55	3.081	0.26918	76.302	82.504	0.3245
2001-02	311.27	94.12	3.3071	0.28582	81.901	79.248	0.3023
2002-03	331.61	102.88	3.223	0.26411	79.818	75.992	0.3102
TOTAL	**1734.27**	**514.79**	**20.371**	**1.76113**	**504.493**	**504.792**	**1.7802**
AVE.	**289.045**	**85.79833**	**3.395167**	**0.293522**	**84.132**	**84.132**	**0.2967**
STANDARD DEVIATION =			**7.53**	**A=84.083**	**CHI-SQUARE =**		**1.775**
Co-Efficient of Variance			**8.949**	**B=-1.628**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The calculated value of chi-square comes to 1.775 which is less than the table value of 11.07 therefore null hypothesis of straight-line assumption for the productivity indices is accepted & alternative hypothesis is rejected.

The overheads input requirement per rupee of output for the Hyderabad cement ltd. Rise from Rs. 0.2476 in 1997-98 it 0.3245 in 1999-2000. However, if the unit had utilized its overheads resources as done in 1997-1998.

(2) MYSORE CEMEMT LTD.:-

Table No.-5.38 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Mysore Cement Ltd.

TABLE NO.-5.38
Analysis of Overhead Productivity Ratio in

Mysore Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	401.22	270.03	1.485	0.070267	100	98.753	0.673
1998-99	334.54	225.48	1.4836	0.069976	99.905	99.777	0.674
1999-00	251.17	181.71	1.3822	0.06158	93.077	100.801	0.7234
2000-01	358.17	224.18	1.5976	0.069006	107.582	101.825	0.6259
2001-02	395.85	247.4	1.6	0.06667	107.744	102.849	0.6249
2002-03	428.94	290.08	1.4786	0.056792	99.569	103.873	0.6762
TOTAL	**2170.43**	**1438.88**	**9.027**	**0.394291**	**607.877**	**607.878**	**3.9974**
AVE.	**361.7383**	**239.813**	**1.5045**	**0.065715**	**101.313**	**101.313**	**0.66623**
STANDARD DEVIATION =			**5.0865**	**A=101.312**	**CHI-SQUARE =**		**1.344**
Co-Efficiency of Variance			**5.021**	**B=0.512**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The above table reveals that output of Mysore Cement Ltd. During the period of study decreased from Rs. 401.22 crores to 251.17 crores in 1999-2000. Then after it showed upward trend and in the last year it was 428.91. While the input during the period of study showed a increased from 270.03 crores in 1997-98 to 290.08 crores in 2002-2003 however it was very low 181.17 crores in 1999-2000. The output input ratio showed mix trend with an average of 1.50 the trend of productivity indices showed towards upward i.e. in 1997-98 it showed 100 and in 2001-2002 it showed 107.44 but in the last year it was declined to 99.569 with an average of 101.31 percent The value of co-efficient of variation shows 5.086 percent during the period study.

In order to test null hypothesis based on chi-square statistics the value of X^2 has also been calculated, which workout to be 1.344 and is less than the critical value of 11.07 hence null hypotheses is accepted and alternative hypothesis is rejected.

The straight-line trend showed a positive pattern of overhead productivity of Mysore with a positive rate of change per year 0.512 percent. Overhead input requirement per rupees of output was fluctuated from 0.6730 in the base year to 0.6762 in the last year.

(3) SHREE DIGVIJAY CEMENT LTD.:-

Table 5.39 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for shree digvijay cement ltd.

TABLE NO.-5.39
Analysis of Overhead Productivity Ratio in Digvijay Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	156.86	142.39	1.101	0.05934	100	95.277	0.9077
1998-99	204.48	242.99	0.841	0.041939	76.294	100.489	1.1883
1999-00	227.07	180.07	1.261	0.06269	114.532	105.701	0.793
2000-01	174.91	117.19	1.4925	0.082138	135.558	110.913	0.67
2001-02	189.28	151.45	1.2497	0.076987	113.505	116.125	0.8001
2002-03	140.1	115.72	1.2106	0.063651	109.954	121.337	0.8251
TOTAL	**1092.7**	**949.81**	**7.157**	**0.386745**	**649.843**	**649.842**	**5.1842**
AVE.	**182.1167**	**158.3017**	**1.19283**	**0.064458**	**108.307**	**108.307**	**0.86403**
STANDARD DEVIATION =			**17.81**	**A=108.307**	**CHI-SQUARE =**		**13.40**
Co-Efficient of Variance			**16.45**	**B=2.61**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The above table described that the output of Shree Digvijay Cement Ltd. was increased from 156.86 crores in 1997-98 to 227.07 crores in 1999-2000. Then after it shows decreased trend to the last year of study period. While the overhead input also decreased from 142.86crores in 1997-98 To 115.72crores in 2002-2003. Owing to speedy rise in the output in comparison to the input the overheads productivity ratio of Digvijay Cement Ltd. went up from 1.101 in 1997-98 to 1.2106 in 2002-2003 but showed mix trend with an average of 1.192 during the study period. Similarly the productivity index also influenced as according to the productivity ratio the average index worked out to 108.307 with a high co-efficient of variation being 17.81 percent.

Further more in order to test the null hypothesis whether the distribution of overhead productivity indices of Shree Digvijay Cement Ltd confirms to the norms of straight line based on least square method it was found that the value of chi-square figured at 13.40 it is above than the table

value hence the null hypothesis is rejected and alternative hypothesis is accepted. The computed value of productivity indices shows a positive growth rate of 2.61 per year resulting in upward trend. It also calculated from table that overheads required per rupees of output ranged from 0.67 to 0.9077.

(4) BIRLA CORPORATION LTD.:-

TABLE NO.-5.40
Analysis of Overhead Productivity Ratio in Birla Corporation Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	845.52	620.87	1.3618	0.091951	100	100.698	0.7343
1998-99	758.22	551.45	1.3749	0.099473	100.961	100.646	0.7272
1999-00	868.38	634.34	1.3689	0.092549	100.521	100.594	0.7304
2000-01	876.79	635.46	1.3797	0.089216	101.314	100.542	0.7247
2001-02	958.55	687.46	1.3943	0.094021	101.386	100.49	0.7171
2002-03	942.65	697.54	1.3513	0.086667	99.228	100.438	0.7399
TOTAL	**5250.11**	**3827.12**	**8.231**	**0.553877**	**603.41**	**603.408**	**4.3736**
AVE.	**875.0183**	**637.8533**	**1.37183**	**0.092313**	**100.568**	**100.568**	**0.72893**
STANDARD DEVIATION =			**0.764**	**A=100.56**	**CHI-SQUARE =**		**0.0343**
Co-Efficient of Vartiance			**0.759**	**B=-0.025**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.40 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Birla Corporation Ltd.

Table also reveals that the output of Birla Corporation Ltd. During the period of study decreased from 845.52 crores in 1997-98 to 758.22 corores in 1998-99. Then it showed increased trend 758.22 to 958.65 in the last years of the study period, while input of overhead during the study period should be shown adequately, increased from Rs. 551.45 in 1998-99 to Rs. 697.54 in 2002-2003. The overhead productivity indices also showed similar results. The productivity ratio of Birla Corporation ltd. showed fluctuated trend the productivity index also showed fluctuated trend with an average 100.56. The

productivity ratio ranged between 1.3513 in 2002-03 to 1.3943 in 2001-2002.The value of co-efficient of variation showed 0.764.

In order to measure the null hypothesis based on chi-square method, the value of chi-square has also been calculated. Which is work out to be 0.0343 and is less than the critical value of 11.07 hence the null hypothesis is accepted and alternative hypothesis is rejected.

The straight line trend showed a negative pattern of overhead productivity of Birla Corporation Ltd. of change 0.025 the overhead requirement per rupees of output for the B.C. ranged from 0.7171 in 2001-2002 to 0.7343 in 1997-98.

(5) CENTURY TEXTILES LTD:-

TABLE NO.-5.41
Analysis of Overhead Productivity Ratio in Century Textile Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1933.86	1085.22	1.7819	0.131086	100	103.768	0.5611
1998-99	1943.6	1037.51	1.8733	0.145764	105.129	103.79	0.5338
1999-00	2149.89	1186.21	1.8124	0.139152	107.711	103.812	0.5517
2000-01	2211.94	1178.06	1.8776	0.137224	105.37	103.834	0.5325
2001-02	2243.1	1227.27	1.8277	0.135603	102.57	103.856	0.5471
2002-03	2241.17	1231.09	1.8204	0.138746	102.16	103.878	0.5493
TOTAL	**12723.56**	**6945.36**	**10.9933**	**0.827575**	**622.94**	**622.938**	**3.2757**
AVE.	**2120.593**	**1157.56**	**1.83222**	**0.137929**	**103.823**	**103.823**	**0.54595**
STANDARD DEVIATION =			**2.522**	**A=103.82**	**CHI-SQUARE =**		**0.368**
Co-Efficient of Variance			**2.429**	**B=0.011**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.41 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for century textile ltd.

Table reveals that the output of Century Textiles Ltd. during the study period increased from 1933.86crores in 1997-1998 to 2141.17crores in 2002-

2003. While the overhead input during this period of study should be shown adequately, increased from 1085.22 crores to 1231.09 crores in 2002-2003. The overhead productivity indices also showed similar result. The productivity ratio of Century Textiles Ltd. showed fluctuated. The productivity index also showed same trend e.g. 100 in 1997-98 to 103.715 in 2002-2003 with an average of 103.82 percent. The value of co-efficient of variation showed 2.429 percent.

In order to measure the null hypothesis based on chi-square method, the value of chi-square has also been calculated. Which is workout to be 0.368 and is less than the table value of 11.07.Hence the null hypothesis is accepted and the alternative hypothesis is rejected. The straight-line trend showed a positive pattern of overhead productivity of Century Textiles. Ltd. changes per year 0.011 the overhead requirement per rupees of output for the Century Textile Ltd., decrease from Rs.0.5611 to Rs.0.5493.

(6) KESORAM TEXTILES MILLS:-

Table No.-5.42 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Kesoram Textiles Ltd.

The above table reveals that the output of Kesoram Textiles Ltd. During the study period increased from Rs. 640.22 crores in 1997-98 to Rs.1159.04crores in 2002-2003 while the overhead input showed a dramatic increased from Rs.390.21crores to 691.72 crores in 2002-2003. The output input ratio showed mix trend with an average of 1.678.The trend of productivity indices showed upward direction during the period of study e.g. 1997-98 it describe 100 and in 2002-2003 it showed 104.926 percent with an average of 103.268 The value of co-efficient of variation describe 4.189 percent.

TABLE NO.--5.42

ANALYSIS OF OVERHEAD PRODUCTIVITY RATIO IN KESORAM MILLS LTD (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	640.22	390.21	1.6407	0.113154	100	101.923	0.6094
1998-99	615.9	368.9	1.6695	0.120757	107.755	102.461	0.5989
1999-00	608.34	386.42	1.5742	0.103806	95.946	102.999	0.6352
2000-01	1116.38	636.23	1.7546	0.093119	106.942	103.537	0.5408
2001-02	112.47	640.12	1.7535	0.102439	106.875	104.075	0.5702
2002-03	1159.04	691.77	1.675	0.101441	102.09	104.613	0.5968
TOTAL	**4252.35**	**3113.65**	**10.0675**	**0.634716**	**619.608**	**619.608**	**3.5513**
AVE.	**708.725**	**518.9417**	**1.677917**	**0.105786**	**103.268**	**103.268**	**0.591883**
STANDARD DEVIATION =			**4.33**	**A=103.26**	**CHI-SQUARE =**		**1.041**
Co-Efficient of Variance			**4.189**	**B=0.268**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

In order to test the null hypothesis based on chi-square statistics the value of chi-square has been measured which worked out to be 1.041 and is less than the table value of 11.07 hence null hypotheses is accepted and the alternative hypothesis is rejected.

The straight-line trend showed a positive pattern of overhead productivity of Kesoram Textiles Ltd. with a positive change of 0.268 per year. Overhead input requirement per rupees of output ranged between 0.5408 in 2000-2001 to 0.6352 in 1999-2000.

(7) INDIAN RAYON & IND. LTD.:-

Table No.-5.43 showed overhead ratio, co-eficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Indian Rayon & Industry Ltd.

TABLE NO.-5.43
Analysis of Overhead Productivity Ratio in Indian Rayon & Ind. LTD. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	

1997-98	1582.25	698.42	2.265	0.13388	100	99.789	0.441
1998-99	1299.03	460.12	2.823	0.19857	124.635	106.139	0.354
1999-00	1072.09	625.12	1.715	0.1077	75.717	112.489	0.582
2000-001	1416.19	470.06	3.012	0.20589	132.98	118.839	0.331
2001-002	1410.63	470.53	2.997	0.20872	132.178	125.189	0.333
2002-003	1443.82	496.05	2.91	0.193897	128.476	131.539	0.343
TOTAL	**8224.01**	**3220.3**	**15.722**	**1.048657**	**693.986**	**693.984**	**2.384**
AVE.	**1370.668**	**536.7167**	**2.62033**	**0.174776**	**115.664**	**115.664**	**0.39733**
STANDARD DEVIATION =			**21.05**	**A=115.664**	**CHI-SQUARE =**		**17.338**
Co-Efficient of Variance			**18.198**	**B=3.175**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

As it may be seen from the table that the value of output of Rayon decreased during the study period with mix trend. The output of Rayon was Rs. 1582.25 crores in 1997-98 to Rs.1443.82 crores in 2002-2003. While the overhead input grew from Rs. 698.42 crores in 1997-98 to 496.05 crores in 2002-2003 due to speedy rise in the input comparison to the overhead productivity ratio also influenced .It showed maximum figured at 3.012 in 2000-2001 and minimum at 1.715 in 1999-2000

Overhead productivity indices remained fluctuating during the period of study. The overall trend of productivity index showed outward trend up to 2001-2002. Then it decreased to 128.476 percent with an average of 115.664 percent. The co-efficient of variation being 18.198 percent.

The calculated values of chi-square come out to 17.338, which is less than the table value of 11.07 percent. Hence the null hypothesis of straight-line assumption for the productivity indices is rejected. The computed value of productivity indices showed a positive growth of 3.175 resulting in a downward trend. The overhead input requirement per rupees of output for this unit shows down ward trend from Rs.0.441 in 1997-98 to 0.343 in 2002-2003.

(8) HINDUSTAN MOTOR LTD.:-

Table No.-5.44 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices,

standard deviation, co-efficient of variation, chi-square and input output ratio for Hindustan Motor Ltd.

TABLE NO.--5.44
Analysis of Overhead Productivity Ratio in Hindustan Motor Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	1003.27	416.35	2.409	0.180205	100	97.49	0.4149
1998-99	1217.56	523.13	2.327	0.153605	95.596	93.652	0.4296
1999-00	1330.81	650.04	2.0472	0.126196	84.981	89.814	0.4884
2000-01	1233.28	623.73	1.9772	0.132527	82.075	85.976	0.5057
2001-02	892.66	440.32	2.0272	0.170415	84.151	82.138	0.4932
2002-03	792.22	407.99	1.941	0.139323	80.572	78.3	0.5149
TOTAL	**6469.8**	**3061.56**	**12.7286**	**0.902271**	**527.375**	**527.37**	**2.8467**
AVE.	**1078.3**	**510.26**	**2.121433**	**0.150378**	**87.895**	**87.895**	**0.47445**
STANDARD DEVIATION =			**7.25**	**A=87.895**	**CHI-SQUARE =**		**0.657**
Co-Efficient of Variance			**8.254**	**B=-1.919**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.44 reveals that the output of Hindustan Motor Ltd during the period of study decreased from Rs.1003.27crores in 1997-98 to Rs.792.22 crores in 2002-2003. While the overhead should be remarkably fluctuated from the lowest 407.99 crores in 2002-2003 to the highest of 650 in 1999-2000. The overhead productivity indices also showed similar results as according to productivity ratio. It showed declining trend during the period of study.i.e.100 in 1997-98 to 73.36 percent with an average of 88.33. The value of co-efficient of variation showed 10.578 percent.

(9) HINDALCO IND. LTD.:-

Table No.-5.45 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Hindalco ltd.

TABLE NO.-5.45

Analysis of Overhead Productivity Ratio in Hindalco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	1474.27	599.64	2.4585	0.15835	100	99.43	0.4067
1998-99	1768.1	705.48	2.5061	0.16361	101.936	101.486	0.399
1999-00	2032.43	795.54	2.5547	0.17419	103.912	103.542	0.391
2000-01	2276.65	865.82	2.6294	0.173675	106.951	105.598	0.3803
2001-02	2332.98	957	2.4378	0.16101	99.158	107.654	0.4102
2002-03	4980.9	1754.63	2.8387	0.11604	115.464	109.71	0.3527
TOTAL	**14865.33**	**5678.11**	**15.4252**	**0.946875**	**627.421**	**627.42**	**2.3399**
AVE.	**2477.555**	**946.3517**	**2.57087**	**0.157813**	**104.570**	**104.570**	**0.38998**
STANDARD DEVIATION =			**5.505**	**A=104.57**	**CHI-SQUARE =**		**0.996**
Co-Efficient of Variance			**5.57**	**B=1.028**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.45 reveals that the output of Hindalco Ltd during the period of study increased from Rs.1474.27crores in 1997-98 to Rs.4980.90crores in 2002-03. While the overhead input during the study period should be remarkably increased from Rs.599.64crores in 1997-98 to 1754.63crores in 2002-03.The productivity indices also showed similar result.

The productivity ratio of Hindalco Ltd. showed adequately increasing trend during the period of study i.g.100 in the base year to 109.968 in 2002-03 with an average of 104.57. The value of co-efficient of variation showed 5.57 percent.

In order to test the null hypothesis based on X^2 test the value of chi-square has also been calculated which was worked out to be 0.996 and is much less than the table value of 11.07. Hence the null hypothesis is accepted and alternative hypothesis that a productivity index of Hindalco Ltd. is rejected.

The straight-line trend showed a positive pattern of overhead productivity of Hindalco Ltd. with a positive growth rate of change per year 1.028. The overhead requirement per rupees of output for the Hindalco Ltd. decreased from 0.4067 in 1997-98 to Rs.0.3527 in 2002-2003.

(10) TEXMACO LTD.:-

Table No.-5.46 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Texmaco Ltd.

TABLE NO.-5.46
Analysis of Overhead Productivity Ratio in Texmaco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	246.62	53.8	4.584	0.3431	100	103.406	0.2181
1998-99	182.79	33.27	5.494	0.4648	119.851	107.794	0.182
1999-00	133.65	26.93	4.962	0.45622	108.246	112.182	0.2014
2000-01	140.52	28.36	4.954	0.4282	108.071	116.57	0.2018
2001-02	95.85	17.53	5.436	0.43986	118.586	120.958	0.1839
2002-03	124.36	20.63	6.0281	0.49375	131.503	125.346	0.1658
TOTAL	**923.79**	**180.52**	**31.4581**	**2.62593**	**686.257**	**686.256**	**1.153**
AVE.	**153.965**	**30.0867**	**5.243017**	**0.437655**	**114.3762**	**114.376**	**0.19217**
STANDARD DEVIATION =			**10.2**	**A=114.376**	**CHI-SQUARE =**		**2.567**
Co-Efficient of Variance			**8.923**	**B=2.194**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.46 reveals that the output of Texmaco Ltd. during the period of study decreased from Rs.246.62crores in 1997-98 to 95.85crores in 2001-02 then in the last year it increased to 124.36crores. While the overhead input during this period of study should be shown adequately, decreased from 53.80 crores in 1997-98 to 17.63crores in 2001-2002. However it increased in the last year to 20.63crores. The overhead productivity indices also showed similar result. The productivity ratio of this unit showed mix and increased trend e.g. 100 in the base year to 155.39 in 2002-2003 with an average of 114.376. The co-efficient of variation showed 8.92 percent.

In order to measure the null hypothesis based on chi-square method the value of chi-square has been calculated which work out to be 2.267 and is greater than critical value of 11.07 hence the null hypothesis is accepted and the alternative hypothesis that overhead productivity indices of the Texmaco Ltd. is rejected.

The straight-line trend showed a positive pattern of overhead productivity of Texmaco Ltd. change per year 2.194 the overhead requirement per rupees of output for the Texmaco Ltd. decreased from Rs.0.218 to Rs.0.0165.

(11) BIRLA POWER & SOLUTION LTD.:-

TABLE NO.-5.47
Analysis of Overhead Productivity Ratio in Birla Power & Solution Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	65.7	23.06	2.849	0.18515	100	101.677	0.3509
1998-99	62.86	21.38	2.9401	0.21461	103.197	99.391	0.3401
1999-00	61.32	23.06	2.6591	0.19951	93.334	97.105	0.376
2000-01	65.29	22.78	2.8661	0.21898	100.6	94.819	0.3489
2001-02	69.35	28.49	2.4341	0.18699	85.436	92.533	0.4108
2002-03	71.17	26.8	2.6555	0.19429	93.208	90.247	0.3765
2TOTAL	**395.69**	**145.57**	**16.4039**	**1.19953**	**575.775**	**575.772**	**2.2032**
AVE.	**65.94833**	**24.26167**	**2.733983**	**0.199922**	**95.962**	**95.962**	**0.3672**
STANDARD DEVIATION =			**5.99**	**A=95.962**	**CHI-SQUARE =**		**1.313**
Co-Efficient of Variance			**6.24**	**B=--1.142**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.47 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Birla Power & Solution Ltd..

The above table reveals that the output of Birla Power and Solutions Ltd. during the period of study increased from 65.70 crores in 1997-98 to 71.17 crores in 2002-03. While the overhead input during this period of study showed increased trend from Rs. 23.06 crores in 1997-1998 to 26.80 crores in 2002-2003. The overhead productivity indices also showed similar results. The productivity ratio of Birla Power and Solutions Ltd. showed slightly fluctuating trend e.g. 100 in base year to 93.208 percent with an average of 95.96. The value of co-efficient of variation showed 6.24 percent.

In order to measure the null hypothesis based on chi-square method, the value of chi-square has also been calculated. Which is work out to be 1.313 and is less than the table value of 11.07. Hence the null hypothesis is accepted and alternative hypothesis is rejected.

The straight-line trend showed a negative trend pattern of overhead productivity of Birla Power and Solutions Ltd. Change per year 1.142 the overhead requirement per rupees of output for the Birla Power and Solutions Ltd. increased from Rs. 0.3509 in 1997-98 to Rs.0.4108 in 2002-2003. In the last year it decreased to Rs.0.3765.

(12) BIRLA V.X.L LTD.:-

Table No.-5.48 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Birla V.X.L. Ltd.

Table No.-5.48
Analysis of Overhead Productivity Ratio in Birla V.X.L. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	482.9	238.22	2.0271	0.1491	100	85.57	0.4933
1998-99	583.23	316.4	1.8433	0.14353	90.932	95.044	0.5424
1999-00	251.21	115.38	2.1772	0.17682	107.404	104.518	0.4592
2000-01	335.28	193.91	1.729	0.14415	85.294	113.992	0.5783
2001-02	230.46	97.58	2.3617	0.20866	116.506	123.466	0.4234
2002-03	232.54	73.82	3.15	0.29084	155.394	132.94	0.3174
TOTAL	**2115.62**	**1035.31**	**13.2883**	**1.1131**	**655.53**	**655.53**	**2.814**
AVE.	**352.603**	**172.5517**	**2.214717**	**0.185517**	**109.255**	**109.255**	**0.469**
STANDARD DEVIATION =			**23.089**	**A109.30**	**CHI-SQUARE =**		**14.10**
Co-Efficient of Variance			**21.13**	**B=4.737**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The above table described that the output of Birla V.X.L. Ltd. was decreased from Rs.482.90crores in 1997-98 to 232.54crores in 2002-2003. While the input decreased from 238.22crores in 1997-98 to 73.82crores in

2002-2003. Owing to speedy rise in the output in comparison to the input the overhead productivity ratio of Birla V.X.L. Ltd. was 2.071 in 1997-98 then after it decreased to 1.843.But in 1999-2000 it showed increased trend. In the last year it was also showed increased 3.15 with an average of 2.21 during the study period. Similarly the productivity index also influenced as according to productivity ratio the average index worked out to 109.225 with a high co-efficient of variation being 21.13 percent

Further in order to test the null hypothesis whether the distribution of overhead productivity indices conforms to the norms of straight line based on least square method it was found that the chi-square figured at 14.10. It is above than the table values hence the null hypothesis rejected and alternative hypothesis is accepted.

The computed values of productivity indices show a positive growth rate of 4.737 per year resulting in a fluctuated trend. It is also calculated from the table overhead requirement per rupee of output ranged Rs.0.3174 in 2002-2003 and Rs.0.5783 in 2000-2001.

(13) JAY SHREE TEA & IND. LTD.:-

Table No.-5.49 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Jay Shree Tea & Ind. Ltd.

The Table No.-5.49 also reveals that output of Jay Shree tea & Ind. Ltd. during the period of study decreased from 511.42crores in 1997-98 to Rs.156.59crores in 2002-2003, while the overhead input showed a dramatic decreased from 59.75crores to 48.83crores in 2001-2002. In the lat year of the study period it increased to 51.30crores. The output input ratio showed mix trend with an average of 3.13. The trend of productivity indices showed down ward direction during the study period e.g. in 1997-98 it describe 100 and in

2002-2003 it showed 86.2649 percent with an average of 88.65 percent. The co-efficient of variation describe 6.52 percent.

TABLE NO.--5.49
Analysis of Overhead Productivity Ratio in Jay Shree Tea & Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	211.42	59.75	3.5384	0.39134	100	95.521	0.28261
1998-99	203.48	62.5	3.25568	0.34107	92.009	92.773	0.30715
1999-00	190.94	62.58	3.05113	0.33885	86.229	90.025	0.32774
2000-01	159.72	53.9	2.9632	0.32548	83.744	87.277	0.33746
2001-02	144.55	48.83	2.9602	0.31081	83.6592	84.529	0.3378
2002-03	156.59	51.3	3.0524	0.3349	86.2649	81.781	0.3276
TOTAL	**1066.7**	**338.86**	**18.82101**	**2.04245**	**531.9061**	**531.906**	**1.92036**
AVE.	**177.7833**	**56.47667**	**3.136835**	**0.340408**	**88.651**	**88.651**	**0.32006**
STANDARD DEVIATION =			**5.78**	**A=88.649**	**CHI-SQUARE =**		**0.774**
Co-Efficient of Variance			**6.522**	**B= -- 1.374**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

In order to test null hypothesis Based on chi-square statistic the value of X^2 has been measure, which worked out to be 0.774 and is less than the table value of 11.07 hence null hypotheses is accepted and the alternative hypothesis is rejected.

The straight-line trend showed a negative pattern of overhead productivity of Jay Shree Tea & Ind. Ltd. with a negative rate of 1.374 changes per year. Overhead input requirement per rupees of output was increased Rs.0.2826 in 1997-98 to Rs.0.3276 in 2002-03.

(14) ZUARI IND. LTD.:-

Table No.-5.50 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Zuari Ind. Ltd.

TABLE NO.-5.50
Analysis of Overhead Productivity Ratio in Zuari Ind. Ltd. (In Crores)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	928.69	283.99	3.27	0.10756	100	100.772	0.3057
1998-99	834.79	208.65	4.009	0.137995	122.599	110.946	0.2499
1999-00	1322.07	465.37	2.8409	0.06833	86.877	121.12	0.352
2000-01	1210.11	245.57	4.9277	0.1485	150.694	131.294	0.2029
2001-02	128.96	231.08	5.3183	0.153635	162.639	141.468	0.188
2002-03	1041.83	236.99	4.396	0.152508	134.434	151.642	0.2274
TOTAL	**4537.76**	**1387.66**	**21.4919**	**0.660968**	**757.243**	**757.242**	**1.2202**
AVE.	**756.2933**	**231.277**	**3.581983**	**0.110161**	**126.207**	**126.207**	**0.20337**
STANDARD DEVIATION =			**26.587**	**A=126.205**	**CHI-SQUARE =**		**18.898**
Co-Efficient of Variance			**21.066**	**B=5.089**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.50 reveals that the output of this company during the period of study increased from 928.69crores in 1997-98 to 1322.07crores in 1999-2000. Then it decreased to 1210.11crores to Rs.1041.83crores in 2002-2003, while the overhead input showed fluctuated trend from 283.99crorer in 1997-98 to Rs.236.99crores in 2002-2003. The output input ratio showed mix trend with an average of 3.58. The trend of productivity indices showed increased from base year to 2001-2002 with an average of 109.54 percent. The value of co-efficient of variation describe 21.066 percent

In order to test the null hypothesis based on chi-square statistics the value of X^2 has been 18.898 and is lees than the table value of 11.07 hence null hypothesis is rejected and the alternative hypothesis is accepted.

The straight-line trend showed a positive pattern of overhead productivity of Zuari Ind. Ltd. with a positive rate of 5.089 changes per year. Overhead input requirement per rupees of output was decreased from 0.3057 in 1997-98 to 0.2274 in 2002-2003

(15) ORIENT PAPER IND. LTD.:-

Table No.-5.51 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Orient Paper Ltd.

TABLE NO.-5.51
Analysis of Overhead Productivity Ratio in Orient Paper Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF.	PROD.	TREND	I/O
				FACTOR	INDEX	VALUE	
1997-98	555.75	348.61	1.5941	0.099174	100	101.832	0.6272
1998-99	546.37	307.75	1.7753	0.12673	111.366	102.098	0.5632
1999-00	488.79	328.41	1.4883	0.10456	93.363	102.364	0.6718
2000-01	551.71	339.77	1.6237	0.10592	101.856	102.63	0.61584
2001-02	583.71	353.65	1.6505	0.106781	103.538	102.896	0.6058
2002-03	589.22	352.48	1.6716	0.105103	104.861	103.162	0.5982
TOTAL	**3315.55**	**2030.67**	**9.8035**	**0.648268**	**614.984**	**614.982**	**3.68204**
AVE.	**552.5917**	**338.445**	**1.63392**	**0.108045**	**102.497**	**102.497**	**0.61367**
STANDARD DEVIATION =			**5.41**	**A=102.50**	**CHI-SQUARE =**		**1.703**
Co-Efficient of Variance			**5.275**	**B=0.133**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.51 reveals that the output of this company during the period of study decreased from Rs.555.75crores in 1997-98 to 546.37crores in 1998-99. Then it showed decreased e.g. in 1999-2000 Rs.488.79crores to 589.22crores in 2002-2003. While the overhead input during the study period should be adequately increased from Rs.348.61crores in 1997-98 to 352.48 crores in 2002-2003. The overhead productivity indices showed similar result the productivity ratio of this unit showed increased trend and the productivity index also showed increased trend e.g. 100 in 1997-98 to 104.861 with an average of 102.49. The value of co-efficient of variation shows 5.275 percent.

In order to test the null hypothesis based on chi-square method, the value of chi-square has also been calculated 1.703, which is less than the table value of 11.07.Hence the null hypothesis is accepted, and the alternative hypothesis is rejected.

The straight-line trend showed a positive pattern of overhead productivity of orient paper ltd. with a positive growth of 0.133 per year. The overhead requirement per rupees of output for the Orient Paper Ltd. decreased from Rs.0.6272 in 1997-98 to Rs. 0.5982 in 2002-2003.

(16) GRASIM IND. LTD.:-

TABLE NO.-5.52
Analysis of Overhead Productivity Ratio in Grasim Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	COEF. FACTOR	PROD. INDEX	TREND VALUE	I/O
1997-98	3499.84	1474.59	2.3734	0.12821	100	101.059	0.4213
1998-99	3756.87	1652.3	2.2737	0.12392	95.799	95.969	0.4398
1999-00	4272.62	2036.15	2.0983	0.11906	88.409	90.879	0.4765
2000-01	4821.71	2178.47	2.2133	0.122459	93.254	85.789	0.4518
2001-02	4372	2326.49	1.8792	0.10906	79.177	80.699	0.5321
2002-03	4609	2646.73	1.7413	0.0952	73.367	75.609	0.5742
TOTAL	**25332.13**	**12314.73**	**12.579**	**0.697909**	**530.006**	**530.004**	**2.8958**
AVE.	**4222.022**	**2052.455**	**2.0965**	**0.116318**	**88.334**	**88.334**	**0.48263**
STANDARD DEVIATION =			**9.34**	**A=88.334**	**CHI-SQUARE =**		**0.823**
Co-Efficient of Variance			**10.578**	**B=-2.545**			

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.52 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Grasim Ind. Ltd.

Table No.-5.52 reveals that the output during the period of study increased from Rs. 3499.84 crores in 1997-98 to 4609 crores in 2002-2003. While the overhead input during this study period should be an adequately increased from Rs. 1474.59 crores in 1997-98 to Rs. 2646.73 crores in 2002-2003. The overhead productivity indices also showed similar results the productivity ratio of this unit also showed fluctuated trend the productivity index also showed fluctuated trend e.g. 100 in 1997-98 to 76.733 in 2002-2003. In 2000-2001 it showed 84.467 percent. The value of co-efficient of variation shows 10.57 percent. In order to test the null hypothesis based on chi-square method. The value of chi-square has also been calculated which is workout to be 0.823 and is less than the critical value of 11.07.hence the null hypothesis is accepted and alternative hypothesis that overhead productivity indices of the grasim ind.ltd.is rejected.

The straight-line trend showed a negative pattern of overhead productivity of grasim ind.ltd with a negative growth rate of change per year 2.545. The overhead requirement per rupee of output for the company increased from Rs. 0.4213 in 1997-98 to Rs. 0.5742 in 2002-2003.

OVERHEAD PRODUCTIVITY RATIOS OF THE SELECTED BIRLA GROUP OF COMPANIES AND KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIATION TEST:

TABLE NO.-5.53
COMPARATIVE OVERHEAD PRODUCTIVITY RATIO OF SELECTED BIRLA GROUP OF COMPANIES WITH KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIANCE TEST.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	4.038	**87**	1.485	**15**	1.101	**2**	1.362	**7**	1.7819	**34**	1.641	**23**	2.265	**50**	2.41	**55**
1998-99	3.396	**88**	1.484	**14**	0.841	**1**	1.375	**9**	1.8733	**39**	1.67	**25**	2.823	**64**	2.33	**52**
1999-00	3.326	**83**	1.382	**11**	1.261	**5**	1.369	**8**	1.8124	**35**	1.574	**18**	1.715	**28**	2.05	**46**
2000-01	3.081	**77**	1.598	**20**	1.493	**17**	1.38	**11**	1.8776	**40**	1.755	**32**	3.012	**74**	1.98	**43**
2001-02	3.307	**82**	1.6	**21**	1.25	**4**	1.394	**12**	1.8277	**37**	1.754	**31**	2.997	**73**	2.03	**45**
2002-03	3.223	**79**	1.479	**13**	1.211	**3**	1.351	**6**	1.8204	**36**	1.675	**27**	2.91	**69**	1.94	**42**
Total Rank		**496**		**94**		**32**		**53**		**221**		**156**		**358**		**283**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	JTEA	R13	ZRY	R14	OPR	R15	GRM	R16
2.459	**58**	4.584	**89**	2.849	**67**	2.027	**44.5**	3.5384	**85**	3.27	**81**	1.5941	**19**	2.37	54
2.506	**59**	5.494	**95**	2.94	**42**	1.843	**38**	3.2557	**80**	4.009	**86**	1.7753	**33**	2.27	51
2.555	**60**	4.962	**92**	2.659	**63**	2.177	**48**	3.0511	**75**	2.841	**66**	1.4883	**16**	2.1	47
2.629	**61**	4.954	**91**	2.866	**68**	1.729	**29**	2.9632	**72**	4.928	**90**	1.6237	**22**	2.21	49
2.438	**57**	5.436	**94**	2.434	**56**	2.362	**53**	2.9602	**71**	5.318	**93**	1.6505	**24**	1.88	41
2.839	**65**	6.028	**96**	2.656	**62**	3.15	**78**	3.0524	**76**	4.396	**94**	1.6716	**26**	1.74	30
	360		**557**		**358**		**291**		**459**		**510**		**140**		**272**

The comparative position of overhead productivity ratios of the selected Birla Group of Companies have been given in Table No.-5.53 along with the application of kruskal Wallis one way analysis of variation test on the above ratios.

K

$$H = \frac{12}{N(n+1)} \sum_{I=1} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk and Ri=sum of the rank

$$K = \frac{12}{96(96+1)} \left[\frac{(496)^2}{6} + \frac{(94)^2}{6} + \frac{(32)^2}{6} + \frac{(53)^2}{6} + \frac{(221)^2}{6} \right.$$

$$\frac{(156)^2}{6} + \frac{(358)^2}{6} + \frac{(283)^2}{6} + \frac{(360)^2}{6} + \frac{(557)^2}{6}$$

$$\left. \frac{(358)^2}{6} + \frac{(291)^2}{6} + \frac{(459)^2}{6} + \frac{(510)^2}{6} + \frac{(140)^2}{6} + \frac{(272)^2}{6} \right] - 3(96+1)$$

$$= 0.00128865 \quad (292813.88) - 291$$

$$= 377.33 - 291$$

$$= 86.33$$

Table No.-5.53 describes the calculated value of ' H' is 86.33 will have a chi-square distribution with K-1 degrees of freedom, where ' K' stands for number of Birla Group of Companies under considerations. Comparison of the calculated value with the critical value of 11.07 it reveals that the calculated value of ' H' is more than the critical value therefore null hypothesis is rejected and alternative hypothesis is accepted.

COMPARATIVE ANALYSIS OF OVERHEAD PRODUCTIVITY:

The Table No.-5.54 explains the input-output ratio efficiency of co-relationship, productivity index, average indices, and trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio of Birla Group of companies.

TABLE NO.-5.54
COMPARATIVE ANALYSIS OF OVERHEAD PRODUCTIVITY

	OUTPUT-INPUT		PROD. Index		CO-EFFIC		CHI-SQUARE		INPUT-OUTPUT		GROWTH RATE		OVER ALL	
	AVE.		AVE.						AVE.				AVE.	
COMPANY	VAL.	RNK	VALUE	RNK	VALUE	RNK	VALUE	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK
CEMENT														

HYD.	3.395	**3**	84.08	**16**	8.949	**6**	1.775	**6**	0.296	**14**	-1.6	**14**	59	6
MYSORE	1.504	**14**	101.3	**10**	5.021	**13**	1.344	**8**	0.666	**3**	0.51	**8**	56	9
SHREE DIG.	1.192	**16**	108.3	**7**	16.45	**4**	13.4	**4**	0.864	**1**	2.61	**4**	36	12
BIRLA COR.	1.371	**15**	100.6	**11**	0.759	**16**	0.034	**16**	0.728	**2**	0.03	**11**	71	1
TEXTILES														
CENTURY TEX.	1.832	**11**	103.8	**7**	2.429	**15**	0.368	**15**	0.545	**6**	0.01	**12**	**66**	3
KESORAM.	1.677	**12**	103.3	**8**	4.189	**14**	1.041	**10**	0.591	**5**	0.27	**9**	**58**	7
INDIA RAYON	2.62	**6**	115.7	**1**	18.2	**3**	17.34	**2**	0.397	**10**	3.18	**3**	**25**	15
AUTO														
H.M.T.	2.121	**9**	87.9	**15**	8.254	**8**	0.657	**14**	0.474	**8**	-1.9	**15**	**69**	2
HINDALCO	2.57	**7**	104.6	**6**	5.57	**11**	0.996	**11**	0.389	**11**	1.03	**7**	**53**	11
ENGINEERING														
TEXMACO LTD.	5.243	**1**	114.4	**2**	8.923	**7**	2.567	**5**	0.192	**16**	2.19	**5**	**36**	13
B.P.&S	2.733	**5**	95.96	**12**	6.24	**10**	1.313	**9**	0.367	**12**	-1.1	**13**	**61**	5
WOOL														
BIRLA VXL	2.214	**8**	109.3	**4**	21.13	**1**	14.1	**3**	0.469	**9**	4.74	**2**	**27**	14
TEA INDUSTY														
JAYSHREE TEA	3.136	**4**	88.65	**13**	6.522	**9**	0.774	**13**	0.32	**13**	1.37	**6**	**58**	7.5
AGRO-IND														
ZUARI	3.581	**2**	109.5	**3**	21.07	**2**	18.9	**1**	0.203	**15**	5.09	**1**	**24**	16
PAPER														
PAPER	1.633	**13**	102.5	**9**	5.275	**12**	1.703	**7**	0.613	**4**	0.13	**10**	**55**	10
DIVERSIFIED														
GRM	2.096	**10**	88.33	**14**	10.58	**5**	0.823	**12**	0.482	**7**	-2.5	**16**	**64**	4
BIRLA GROUP	**2.432**		**101.1**		**9.347**		4.821		**0.475**		**0.87**		**51**	

OVERALL PRODUCTIVITY:

It has already been mentioned the productivity is a ratio of output to input. Productivity ratio is said to be a measure of efficiency. The various inputs are material, manpower, capital goods and expense of manufacturing, selling and distribution etc. When all the input is added together and the productivity ratio is calculated it is termed as overall productivity ratio. In order to revolve the problem of calculation of the overall productivity ratio the data needed are: output and total input. Total input includes the elements of costs such as material, manpower and overhead. "When a number of factors

are not valued in the production process but the output is related to any single factor unit. Productivity thus measured is called factor or partial productivity.

According to Shrivastava J. P. "There is a general agreement among different writes that the over all productivity ratio measure the total productivity efficiency of the combined resources input used by an enterprise.' '

The present research study outlined total input includes labour, material, and overhead calculated with base year 1997-98 prices to indicate the change in productivity efficiency over the base year.

$$\text{OVERALL PRODUCTIVITY RATIO} = \frac{\text{TOTAL OUTPUT}}{\text{TOTAL INPUT}}$$

Total Inputs = Total Material Input + Total Labour Input
+ Total Overhead Input

STEPS IN CALCULATION FOR TOTAL PRODUCTIVITY

HYPOTHESIS:-

For the calculation in present study two hypothesis (null and alternative) have been framed and tested. The first hypothesis is shown whether the total productivity indices can be approximately as a straight-line trend. While second hypothesis describe whether there is any significant difference between the overall productivity of the selected Birla group of companies.

HYPOTHESIS BASED ON CHI-SQUARE:

Null hypothesis: The total productivity indices can be represented by the line of the best-fit based on least square methods.

Alternative hypothesis:-The productivity induces can' t be represented by the straight line

Level of significant: 5 percent

Statistical tool used: chi-square

Critical value: 11.07

When the calculated value of chi-square remains less than the table or critical value the null hypothesis is accepted otherwise it is rejected. The acceptance of null hypothesis would mean that the indices could be represented by straight line. It may represent the pattern and growth of the total productivity.

NULL HYPOTHESIS BASED ON KRUSKAL WALLIS ONE WAY ANALYSIS OF VARIANCE TEST:

Null hypothesis: The difference between the total productivity of the selected Birla group of companies.

Alternative hypothesis: The total productivity ratio of the selected Birla Group of companies difference significantly.

Level of significant: 5 percent

Statistical tool used: kruskal Wallis

Critical value: 24.996

The acceptance of null hypothesis would mean that there is no significant difference between total productivity of selected Birla Group of companies the rejection of null hypothesis and acceptance of its alternative hypothesis would mean that there is significant difference between the overall productivity ratios of the selected Birla Group of companies.

OVERALL PRODUCTIVITY IN SELECTED COMPANIES

Table 5.55 to 5.72 describes the overall productivity ratio and index of overall productivity, average of overall indices, co-efficient of variation, and the value of chi-square for selected Birla Group companies under study.

(1) HYDERABAD CEMENT LTD.:-

Table No.-5.55 showed the various facts about the total productivity in Hyderabad Cement Ltd. from the period of 1997-98 to 2002-2003 of study.

TABLE NO.-5.55
Analysis of Overall Productivity Ratio in Hyderabad Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD.	TREND	I/O
				INDEX	VALUE	
1997-98	276.62	256.08	1.08	100	95.584	0.925
1998-99	271.33	270.65	1.002	92.77	94.948	0.997
1999-00	270.61	272.75	0.993	91.94	94.312	1.006
2000-00	269.75	279.28	0.965	89.35	93.676	1.035
2001-02	311.27	301.9	1.031	95.462	93.04	0.969
2002-03	331.69	325.18	1.02	94.44	92.404	0.98
TOTAL	**1731.27**	**1705.84**	**6.091**	**563.96**	563.964	**5.912**
AVE.	**288.545**	**284.307**	**1.01517**	**93.994**	**93.994**	**0.985333**
STANDARD DEVIATION =			**3.3093**	**CHI-SQUARE =**		**0.621**
Co-Efficient of Variance			**3.52**	**A=93.993**	**B= --0.319**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The table no.-5.55 reveals that the total output in Hyderabad Cement Ltd. increased by 19.90 percent from Rs.276.62crores in 1997-98 to Rs. 331.69crores in 2002-2003. While the total input increased 26.98 percent from Rs.256.08crores in 1997-98 to Rs.325.18crores in 2002-2003. The annual average input figured at Rs.284.30crores.

Since the input went up much more rapidly in comparison with the output. The total productivity index reveals a mix trend from 100 in the base year to 94.44 percent in 2002-2003. The average index showed was at 97.24 with a co-efficient of co-variation showed 3.52 percent. The index shows moderate fluctuations through the period of study with remains at 97.24 percent over the base year.

However the value of null hypothesis based on chi-square statistics (0.621) was less than the table value of 11.07. The null hypothesis assumes straight-line approximation to the productivity index with fluctuated trend and average annual negative change of 0.319 percent. It is apparent that the total

input requirement per rupees of output Rs.0.925 in 1997-98 to Rs.0.980 in 2002-03.

(2) MYSORE CEMENT LTD.:

TABLE NO.-5.56
Analysis Overall Productivity Ratio in Mysore Cement Ltd. (CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	401.22	452.94	0.885	100	97.412	1.128
1998-99	334.54	381.85	0.876	98.98	97.346	1.141
1999-00	251.17	312.45	0.803	90.73	97.28	1.243
2000-01	356.71	420.18	0.848	95.81	97.214	1.177
2001-02	395.85	446.29	0.886	100.11	97.148	1.127
2002-03	428.94	494.78	0.866	97.85	97.082	1.153
TOTAL	**2168.43**	**2508.49**	**5.164**	**583.48**	**583.482**	**6.969**
AVE.	**361.405**	**418.0817**	**0.860667**	**97.247**	**97.247**	**1.1615**
STANDARD DEVIATION =			**3.26**	**CHI-SQUARE =**		**0.653**
Co-Efficient of Variance			**3.35**	**A=97.246**	**B=0.032**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND A'C'S

Table No.-5.56 presented the total productivity and its analysis for Mysore Cement Ltd. for the period under study. The Table reveals that the output of Mysore Cement Ltd. was decreased from Rs.401.22crores in 1997-98 to 334.54crores in 1998-99. Then the output also decreased to Rs.251.17crore which very low. But again it increased up to last year of study period. The average output showed 261.40crores. Total input describe upward trend except base year from 381.85crores in 1998-99 to Rs.494.78crores in 2002-2003 with an average of 418.08 Crores.

It is also observed that the productivity index showed mix and upward trend. The average index showed 97.25 percent. The value of chi-square calculated at 0.653, which was much less than the table value of 11.07. Therefore the null hypothesis is accepted which is assuming straight line approximately for the productivity indices.

The straight line in the case of Mysore Cement Ltd. showed an upward trend of productivity efficiency with an average annual positive rate of change 0.032. The material input requirement per rupees of output increased from Rs.1.128 in 1997-98 to Rs.1.153 in 2002-2003. The total input requirement per rupees of output worked out as high as 1.177 in 2000-2001 representing 4.34 percent rise over the base year figure of 1.128.

(2) SHREE DIGVIJAY CEMENT LTD.:-

Table No.-5.57 showed the total productivity and its analysis for Shree Digvijay Cement Ltd. for the covered by this study from 1997-98 to 2002-2003. The table showed that the output of this shows down ward trend.

TABLE NO.-5.57
Analysis of Overall Productivity Ratio in Digvijay Cement Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	156.86	205.52	0.763	100	98.496	1.31
1998-99	204.48	316.1	0.646	84.665	102.496	1.545
1999-00	227.07	252.84	0.898	117.693	106.496	1.113
2000-01	174.91	182.57	0.958	125.55	110.496	1.043
2001-02	189.28	216.46	0.874	114.547	114.496	1.143
2002-03	140.1	169.06	0.828	108.519	118.496	1.206
TOTAL	**1092.7**	**1342.55**	**4.967**	**650.974**	**650.976**	**7.36**
AVE.	**182.1167**	**223.7583**	**0.82783**	**108.4957**	**108.496**	**1.2267**
STANDARD DEVIATION =			**13.242**	**CHI-SQUARE =**		**7.193**
Co-Efficient of Variance			**12.21**	**A=108.495**	**B=2.00**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

It ranged from the lowest Rs.156.86crores in 1997-98 to highest Rs.227.07 crores in 1999-2000. However in the base year it was 156.86crores but then in 1998-99 it increased to 204.48. Then after it showed the decreased trend .The average carries out to Rs.182.11crores. The total input went down during the study period.

It was Rs.205.52 crores to 169.06 Crores in 2002-03 representing 17.74 percent decreased. The average input remained at 223.75crores. The rapid

deceased in total output in comparison with decreased in input by 17.14 percent since the total input expanded slowly as computed to the decreased in output. The total productivity index varied from 100 in base year to 108.52 with a co-efficient of variation as high as 0.923 percent.

The value of chi-square figured at 7.193 is less than the table value 11.07 hence the null hypothesis is accepted and alternative hypothesis is rejected, which represented by straight line. The straight line showed positive annual growth of 2.00, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 1999-2000. It' s good sigh of this company for that year in the case of total productivity.

(4) BIRLA CORPORATION LTD.:-

Table No.-5.58 showed the various facts about the total productivity in Birla Corporation Ltd. during the research study. The table reveals that the total output deceased from Rs.845.52crores to 758.22crores in 1998-99. Then the trend of output increased through out the study period. While the total input increased by 959.10crores in 1997-98 to Rs.1071.93crores in 2002-2003 with an average of 989.65.

The total productivity index reveals a down ward trend from 100 in the base year to 99.318 in 1999-2000. But then it went up from 2000-2001 to 2001-2002. It the last year it was 99.772.The average index was at 100.30 with a co-efficient of variation of 0.923 percent. The index showed moderate fluctuation throughout the period of study.

TABLE NO.- 5.58
Analysis of Overall Productivity Ratio in
Birla Corporation Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	845.52	959.1	0.881	100	99.897	1.134
1998-99	758.22	862.43	0.8791	99.772	100.059	1.137

1999-00	868.38	991.6	0.875	99.318	100.221	1.141
2000-01	876.79	978.25	0.896	101.7	100.383	1.115
2001-02	958.55	1074.6	0.892	101.248	100.545	1.121
2002-03	942.65	1071.93	0.8793	99.772	100.707	1.137
TOTAL	**5250.11**	**5937.91**	**5.3024**	**601.81**	601.812	**6.785**
AVE.	**875.0183**	**989.652**	**0.88373**	**100.302**	**100.302**	**1.13083**
STANDARD DEVIATION =			**0.926**	**CHI-SQUARE =**		**0.0399**
Co-Efficient of Variance			**0.923**	**A=100.34**	**B=0.081**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The calculation value of chi-square was 0.0399, which is very less than the table value of 11.07 hence the null hypothesis is accepted, and alternative hypothesis is rejected. It means that the index does not follow the trend value. The straight line in case of this company showed upward pattern of productivity efficiency with an average annual positive rate of change 0.081.

The total input requirement per rupees of output range between Rs 1.121 and Rs.1.141 during the period of study. The total input required per rupee of output average in the company was below the combined average by 10.10 percent. Thus it can be said that resources have been efficiently utilized and the overall productivity was good in the company.

(5) CENTURY TEXTILES LTD.:

Table No.-5.59 represented the over all productivity and its analysis for Century Textiles Ltd. for the period covered by this study. The table showed that the output was during the study period of study. It ranged from lowest of Rs.1933.86crores in 1997-98 to highest 2241.17crores in 2002-2003. The averages came out at Rs.2120.577crores. The total input showed increased trend from Rs.1990crores in 1997-98 to Rs.2304.94crores in 2002-2003 with an average of 2178.688crore.

TABLE NO.-5.59

Analysis of Overall Productivity Ratio in Century Textiles Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	1933.86	1990	0.971	100	99.957	1.029
1998-99	1943.5	1996.07	0.973	100.2	100.049	1.026
1999-00	2149.89	2216.01	0.97	99.89	100.14	1.03
2000-01	2211.94	2281.85	0.969	99.79	100.232	1.031
2001-02	2243.1	2283.26	0.982	101.132	100.323	1.017
2002-03	2241.17	2304.94	0.972	100.102	100.415	1.028
TOTAL	**12723.46**	**13072.13**	**5.837**	**601.114**	601.116	**6.161**
AVE.	**2120.577**	**2178.688**	**0.972833**	**100.186**	**100.186**	**1.02683**
STANDARD DEVIATION =			**0.443**	**CHI-SQUARE =**		**0.0103**
Co-Efficient of Variance			**0.442**	**A=100.34**	**B=0.0458**	

SOURSCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The productivity index showed mix trend with an average of 100.18. The value of chi-square calculated at 0.0103 is less than the table value of 11.07. Therefore the null hypothesis assuming the straight-line approximation for the productivity indices is accepted. The pattern of straight line of productivity efficiency with an average of annual positive growth rate of changes 0.0458.

The material output requirement per rupees of output range Rs1.017 in 2001-2002 to Rs.1.031 in1999-2000. The total input requirement per rupees of output worked out as high as 1.031 in 1999-2000. Representing percent rise over the base year figure of 0.194.

(6) KESORAM MILLS LTD.:-

Table No.-5.60 showed the overall productivity and its analysis for Kesoram Mills Ltd. for the period covered by this study.

TABLE NO.-5.60

Analysis of Overall Productivity Ratio in Kesoram Mills Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	640.22	3328.7	0.192	100	83.484	5.199

1998-99	615.9	3715.2	0.165	85.937	94.882	6.032
1999-00	608.34	4206.98	0.144	75	106.28	6.915
2000-01	1116.38	4287.33	0.26	135.416	117.678	3.84
2001-02	1122.47	4150.23	0.27	140.625	129.076	3.697
2002-03	1159.04	4458.54	0.259	134.895	140.474	3.846
TOTAL	**5262.35**	**24146.98**	**1.29**	**671.873**	671.874	**29.529**
AVE.	**877.0583**	**4024.497**	**0.215**	**111.979**	**111.979**	**4.9215**
STANDARD DEVIATION =			**26**	**CHI-SQUARE =**		**17.24**
Co-Efficient of Variacen			**23.298**	**A=100.97**	**B=5.699**	

SOURCES: COMPILED FROM ANNUAL REPORTS & ACCOUNTS

The table showed that the output was increased during the period of study. It ranged from lowest of Rs.640.22crores in 1997-98 to highest Rs.1159.04crores in 2002-2003. The average came out at Rs.877.058crores. The productivity index also showed increased trend after first year with an average of 111.97 percent.

The value of chi-square calculated at 17.24 was less than the table value of 11.07. Therefore the null hypothesis, assuming the straight-line approximation for the productivity indices is rejected. The pattern of straight-line of productivity efficiency with an average annual positive growth rate of changes 5.699. The material output requirement per rupees of output decreased by 66.47 from 5.199 in 1997-98 to 3.846 in 2002-2003. The total input requirements per rupees of output worked out as high as 6.915 in 1999-2000.

(7) INDIAN RAYON & IND. LTD.:-

Table No.-5.61 represented the total productivity and its analysis for Indian Rayon & Ind, Ltd. for the covered by this study from 1997-98 to 2002-2003.

TABLE NO.-5.61
Analysis of Overall Productivity Ratio in Indian Rayon & Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND	I/O
1997-98	1582.25	1275.97	1.24	100	93.31	0.806
1998-99	1299.03	1071.41	1.212	97.741	92.12	0.824

1999-00	1072.09	1240.92	0.863	69.596	90.93	1.157
2000-01	1416.19	1236.3	1.145	92.338	89.74	0.872
2001-02	1410.63	1243.34	1.134	91.451	88.55	0.881
2002-03	1443.82	1280.79	1.127	90.887	87.36	0.887
TOTAL	**8224.01**	**7348.73**	**6.721**	**542.013**	542.01	**5.427**
AVE.	**1370.668**	**1224.788**	**1.12017**	**90.335**	**90.335**	**0.9045**
STANDARD DEVIATION =			**9.87**	**CHI-SQUARE =**		**6.14**
Co-Efficient of Variance			**10.92**	**A=90.335**	**B=-0.595**	

SOURCES: -COMPILED FROM ANNUAL REPORTS & ACCOUNTS

The above table showed that the output of this shows upward trend. It ranged from the lowest of Rs.1299.03crores in 1997-98 to highest 1443.82 crores in 2002-2003. The average output Rs.1370.66crores .the total input went up during the period. It was Rs.1275.40crores in 1997-98 to Rs.280.79 crores in 2002-2003 representing an increase by 100.37 percent.

The average input remained at Rs.1224.78crores. The rapid growth in total output in comparison with rise in input to 100.37 percent since the total input expanded slowly as computed to the rise in output. The total productivity index varied from 100 in base year to 90.88 in 2002-2003. The average index came out at 90.33 with a co-efficient of variation as high as 10.92 percent.

The value of chi-square figured at 6.14 is les than the table value 11.07 hence null hypothesis is accepted and the alternative hypothesis is rejected, which represented by straight line. The straight line showed a negative growth of 0.595, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 1997-98 figured at 0.806. It is a god sighs of this company for that year in the case of total productivity.

(8) HINDUSTAN MOTOR LTD.:-

Table No.-5.62 showed the various facts about the total productivity in Hindustan Motor Ltd. during the research study.

Table No.-5.62
Analysis of Overall Productivity Ratio in

Hindustan Motor Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	1003.27	1198.09	0.837	100	98.286	1.194
1998-99	1217.58	1531.09	0.795	94.982	94.798	1.257
1999-00	1330.81	1753.97	0.758	90.561	91.31	1.317
2000-01	1233.28	1623.39	0.759	90.681	87.822	1.316
2001-02	692.66	1154.69	0.599	71.565	84.334	1.667
2002-03	792.22	1055.75	0.75	89.605	80.846	1.332
TOTAL	6269.82	8316.98	4.498	537.394	537.396	8.083
AVE.	**1044.97**	**1386.163**	**0.749667**	**89.5656**	**89.566**	**1.34717**
STANDARD DEVIATION =			**8.798**	**CHI-SQUARE =**		**3.011**
Co-Efficient of Variance			**9.823**	**A=89.565**	**B=--1.744**	

SOURCES: COMPILED FROM ANNUAL REPORTS & ACCOUNTS

The table reveals that total output increased from Rs.1003.27crores to Rs.1233.28crores in 2000-2001. Then it decreased from Rs.1233.28crores to Rs.792.22crores in the last year. While the total input fluctuated from 1198.09 crores in 1997-98 to 1055.75crores in 2002-2003. However it was highest in 1999-2000 by 1753.97crores. The average of this was 1386.16crores. The total productivity index reveals a down ward trend from 100 in the base year to 89.605 in 2002-2003. The average index was at 89.56 with a co-efficient of variation 9.823 percent. The index showed moderate fluctuation through out the period of study.

The value of chi-square calculated at 3.011 is less than the table value 11.07. Therefore the null hypothesis assuming straight-line approximation for the productivity indices is accepted. The straight line in case of this company shows moderate pattern productivity efficient with an average annual negative rate of change 1.744.

It may be observed from above table that there are considerable rise in material, labour and overhead. The selected Birla group of companies needs to constant over proper planning and control of material recovery, lack of control over expenses and efficient handling.

The total inputs requirement per rupees of output ranged between Rs. 1.194 in 1997-98 to 1.667 in 2002-2003 during the study period .

(9) HINDALCO LTD.:-

Table No.-5.63 showed the various facts about the total productivity in Hindalco Ltd. during the research study.

Table No.-5.63
Analysis of Overall Productivity Ratio in Hindalco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	1474.27	1071.93	1.375	100	106.331	0.727
1998-99	1768.1	1271.97	1.39	101.09	103.575	0.719
1999-00	2032.43	1396	1.455	105.818	100.819	0.686
2000-01	2276.65	1522.22	1.495	108.727	98.063	0.668
2001-02	2332.98	1686.58	1.383	100.58	95.307	0.722
2002-03	4980.9	4501.15	1.106	80.43	92.551	0.903
TOTAL	**14865.33**	**11449.85**	**8.204**	**596.645**	596.646	**4.425**
AVE.	**2477.555**	**1908.308**	**1.367333**	**99.441**	**99.441**	**0.7375**
STANDARD DEVIATION =			**9.06**	**CHI-SQUARE =**		**3.723**
Co-Efficient of Variance			**9.112**	**A=99.44**	**B=-1.378**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The table reveals that the total output in Hindalco Ltd. increased by 337.85 percent from Rs.1474.27crores in 1997-98 to Rs.4980.90crores in 2002-2003. While the total input increased 419.91 percent from Rs.1071.93 crores to 4501.15crores in 2002-2003.The annual average input figured at Rs.1908.308.Since the input went up much more rapidly in comparison with the output. The total productivity index reveals a upward trend up to 2000-2001. Then it decreased up to last year. The average index was at 99.44 percent with a co-efficient of variation showed 9.112 percent. The index shows moderate fluctuation through out the period of study.

However the value of null hypothesis based on chi-square statistics 3.723 was less than the table value of 11.07.The null hypothesis assumes

straight-line approximation to the productivity index with upward direction and average annual negative growth change of 1.378 percent.

It apparent that the total input requirement per rupees of output of Rs. 0.727 in 1997-98 to increased in the last year to 0.903 with an increase of 124.21 percent average requirement it less than the base year requirement per rupees of output in the case material.

(10) TEXMACO LTD.:-

Table No.-5.64 represented the total productivity and its analysis for Texmaco Ltd. for the period under study.

TABLE NO.-5.64
Analysis of Overall Overhead Productivity Ratio in Texmaco Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD.	TREND	I/O
				INDEX	VALUE	
1997-98	246.62	253.76	0.971	100	102.03	1.028
1998-99	182.79	185.95	0.983	101.235	101.714	1.017
1999-00	133.65	128.11	1.043	107.415	101.398	0.958
2000-01	140.52	142.03	0.989	101.853	101.082	1.01
2001-02	95.85	105.91	0.905	93.202	100.766	1.104
2002-03	124.36	123.47	1.007	103.707	100.45	0.992
TOTAL	923.79	939.23	5.898	607.412	607.44	6.109
AVE.	**153.965**	**156.5383**	**0.983**	**101.24**	**101.24**	**1.01817**
STANDARD DEVIATION =			**4.15**	**CHI-SQUARE =**		**1.078**
Co-Efficient of Variance			**4.1**	**A=101.235**	**B=--0.158**	

SOURCES: COMPILED FROM ANNUAL REPORTS & ACCOUNTS

The Table No.-5.64 showed that the output of this unit showed down ward trend. It ranged from the lowest Rs.95.85crores in 2001-2002 to the highest Rs.246.62crores in 1997-98. The average carries out to Rs.153.96crores. The total input went down during the period of study. It was Rs.253.76crores in 1997-98 to Rs.123.47crores in 2002-2003.

The average of input was 156.53crores. The rapid growth in total output in comparison with fall in output 48.65 percent. The total productivity index varied from 100 in base year to 103.707 in 2002-2003. The average was 101.23 with a co-efficient of variation of 7.59 percent

The value of chi-square figured at 1.078 is less than the table value 11.07 hence the null hypothesis is accepted and alternative hypothesis is rejected, which represented by straight line. The straight line showed a negative annual growth of 0.158, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 0.958 in 1999-2000. It is a good sigh for the company

(11) BIRLA POWER & SOLUTION LTD.:-

Table No.-5.65 represented the total productivity and its analysis for Birla Power & Solution Ltd. during the period of study.

TABLE NO.-5.65
Analysis of Overall Productivity Ratio in Birla Power & Solution. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	65.7	58.35	1.125	100	99.479	0.888
1998-99	62.86	58.02	1.083	96.266	95.545	0.923
1999-00	61.32	60.09	1.02	90.666	91.611	0.979
2000-01	65.29	67.59	0.965	85.777	87.677	1.035
2001-02	69.35	72.54	0.955	84.888	83.743	1.045
2002-03	71.17	78.78	0.903	80.266	79.809	1.106
TOTAL	**395.69**	**395.37**	**6.051**	**537.864**	**537.864**	**5.976**
AVE.	**65.94833**	**65.895**	**1.0085**	**89.64383**	**89.644**	**0.996**
STANDARD DEVIATION =			**6.8**	**CHI-SQUARE =**		**0.0774**
Co-Efficient of Variance			**7.59**	**A=89.64**	**B=-1.967**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The table reveals that the output of this shows upward trend. It ranged from the lowest Rs.61.32crores in 1999-2000 to the highest Rs.71.17crores in 2002-2003. The average carries out to Rs.65.942crores. The total input went up during the period of study. It was Rs.58.35crores in 1997-98 to Rs.78.78 crores in 2002-03 representing an increase by 135.01 percent.

The average input remained at Rs.65.89crores. The total input expanded speedily as computed to the rise in output. The total productivity index varied from 100 in the base year to 80.26 in 2002-2003. The average index came out at 89.64 with a co-efficient of variation as high as 7.59 percent.

The value of chi-square figured at 0.0774 is less than the table value 11.07 hence null hypotheses are accepted and the alternative hypothesis is rejected, which represented by straight line. The straight line showed negative annual growth of 1.967, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 0.888 in 1997-98.It' s a good sigh of this company for that year in the case of total productivity.

(12) BIRAL V.X.L. LTD.:-

TABLE NO.-5.66
Analysis of Overall Productivity Ratio in Birla V.X.L.Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	482.9	475.88	1.014	100	96.604	0.985
1998-99	583.23	593.42	0.982	96.844	97.184	1.017
1999-00	251.21	240.89	1.042	102.761	97.764	0.958
2000-01	335.28	393.96	0.852	84.023	98.344	1.173
2001-02	230.46	234.23	0.983	96.942	98.924	1.016
2002-03	232.54	212.83	1.0926	107.751	99.504	0.915
TOTAL	2115.62	2151.21	5.9656	588.324	588.324	6.064
AVE.	**352.6033**	**358.535**	**0.99427**	**98.0535**	**98.054**	**1.010667**
STANDARD DEVIATION =			**7.297**	**CHI-SQUARE =**		**3.184**
Co-Efficient of Variance			**7.443**	**A=98.05**	**B=0.290**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

Table No.-5.66 represented the total productivity and its analysis for Birla V.X.L Ltd. for the period under study. The table showed that the output of this shows downward trend. It ranged from the lowest of Rs.230.46crores in 2001-2002 to highest Rs.583.23crores in 1998-99. The average carries out to

Rs.352.60crores. The total input went down during the period of study. It was Rs.475.88crores in 1997-98 to 212.83crores in 2002-03 representing a decrease by 44.72 percent.

The average input remained at Rs.358.53crores. The rapid growth in total output in comparison with falls in input by 44.72 percent since the total input expanded slowly as computed to the fall in output.

The total productivity index varied from 100 in base year to 107.75 in 2002-2003. The average index came out at 98.05 with a co-efficient of variation as high as 7.44 percent.

The value of chi-square figured at 3.184 is less than the table value 11.07 hence null hypotheses is accepted and alternative hypothesis is rejected, which represented by straight line. The straight line showed a positive annual growth of 0.290, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 0.915 in 2002-2003.It' s good sigh of this company for that year in the case of total productivity.

(13) JAYSHREE TEA & IND. LTD.:-

Table No.-5.67 represented the total productivity and its analysis during the study period. The Table reveals that the total output decreased by 74.06 percent from Rs.211.42crores in 1997-98 to 156.59crores in 2002-2003. While the total input decreased by 94.18 percent from Rs.175.82crores in 1997-98 to Rs.165.59crores in 2002-2003. The average annual input figured at Rs.172.72crores. Since the output went down rapidly in comparison with the input, the total productivity index reveals a downward trend from 100 in the base year to 75.272 in 2002-2003. The average index was at 85.34 with a co-efficient of variation 9.6 percent.

TABLE NO.-5.67
Analysis of Overall Productivity Ratio in Jay Shree Tea & Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD.	TREND	I/O

				INDEX	VALUE	
1997-98	211.44	175.82	1.202	100	96.043	0.831
1998-99	203.48	182.64	1.114	92.678	91.763	0.891
1999-00	190.94	192.49	0.991	82.445	87.483	1.008
2000-01	159.72	168.75	0.946	78.702	83.203	1.056
2001-02	144.55	151.03	0.957	79.617	78.923	1.044
2002-03	156.59	165.59	0.945	78.618	74.643	1.0574
TOTAL	**1066.72**	**1036.32**	**6.155**	**512.058**	**512.058**	**5.8874**
AVE.	**177.7867**	**172.72**	**1.02583**	**85.3433**	**85.343**	**0.981233**
STANDARD DEVIATION =			**8.16**	**CHI-SQUARE =**		**0.924**
Co-Efficient of Variance			**9.56**	**A=85.343**	**B=--2.14**	

SOURCES: COMPILED FROM ANNUAL REPORTS & ACCOUNTS

The value of chi-square calculated at 0.924 is less than the table value 11.07. Therefore the null hypothesis assuming straight-line approximation for the productivity indices is accepted. The straight-line case of this company showed downward pattern of productivity efficiency with an average annual negative rate of change 2.14. The total input requirement per rupees of output ranged between Rs.0.831 in 1997-98 to Rs.1.0574 in 1999-2000. The company has utilized the material, labour and overhead efficiently.

(14) ZUARI AGRO IND. LTD.:-

Table No.-5.68 represented the total productivity and its analysis for Zuari Ltd. for the period under study.

The table reveals that the total output increased by112.19 percent from Rs.928.59crores in 1997-98 to Rs.1041.83crores in 2002-2003. While the total input increased by 127.96 percent from Rs.880.67crores in 1997-98 to Rs.1126.92crores in 2002-2003. The average annual input figured at Rs.1075.09crores. Since the input went up rapidly in comparison with the output, the total productivity index reveals a downward trend from 100 in the base year to 87.66 in 2002-2003. The average index was at 97.40 with a co-efficient of variation 6.40 percent. The index showed very high fluctuation throughout the period of study.

Table No.-5.68
Analysis of Overall Productivity Ratio in Zuari Agro Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	928.59	880.67	1.054	100	91.712	0.948
1998-99	834.79	738.07	1.131	107.305	93.99	0.884
1999-00	1322.07	1363.63	0.969	91.935	96.268	1.031
2000-01	1210.11	1166.13	1.037	98.387	98.546	0.963
2001-02	1228.86	1175.12	1.045	99.146	100.824	0.956
2002-03	1041.83	1126.92	0.924	87.666	103.102	1.081
TOTAL	6566.25	6450.54	6.16	584.439	584.442	5.863
AVE.	**1094.375**	**1075.09**	**1.026667**	**97.407**	**97.407**	**0.977167**
STANDARD DEVIATION =			**6.24**	**CHI-SQUARE =**		**5.169**
Co-Efficient of Variance			**6.4**	**A=97.406**	**B=--1.138**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The value of chi-square calculated at 5.169 is less than the table value of 11.07. Therefore the null hypothesis assuming straight-line approximation for the productivity indices is accepted. The straight line in case of this company showed downward pattern of productivity efficiency with an average annual negative growth rate of change (1.138) It may be observed from the above table that there were considerable rise in material, labour, and overheads. The selected Birla Group of companies requires concentrate over proper planning and control of material, lack of control over expenses and efficient handling.

The total inputs requirements per rupee of output ranged between Rs.0.948 and Rs.1.081 in 2002-2003 during the period of study.

(15) ORIENT PAPER LTD.:-

Table No.-5.69 presented the total productivity and its analysis for Orient Paper Ltd., for the covered by this study from 1997-98 to 2002-2003.

The table showed that the output of this shows fluctuated trend. It ranged from the lowest of Rs.488.79crores in 1999-2000 to the highest Rs.

589.22crores in 2002-2003. The average carries out to Rs.552.625crores. The total input went up during the period of study. It was Rs.662.25crores in 1997-98 to Rs.642.78crores in 2002-2003 representing an increase 103.30.

The average input remained at Rs2608.172crores. The rapid growth in total output in comparison with rises in input to 103.30 percent, since the total input expanded highly as computed to the rises in output. The total productivity index varied from 100 in the base year to 102.57crores in 2002-2003. The average index came out at 101.66 with a co-efficient of variation as high as 3.85 percent.

TABLE NO.--5.69
Analysis of Overall Productivity Ratio in Orient Paper Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	555.75	622.25	0.893	100	98.485	1.119
1998-99	546.37	609.59	0.896	100.335	99.755	1.115
1999-00	488.79	574.96	0.85	95.184	101.025	1.176
2000-01	551.91	594.36	0.928	103.919	102.295	1.076
22001-2	583.71	605.1	0.964	107.95	103.565	1.036
2002-03	589.22	642.78	0.916	102.575	104.835	1.09
TOTAL	**3315.75**	**3649.04**	**5.447**	**609.963**	**609.963**	**6.612**
AVE.	**552.625**	**608.1733**	**0.907833**	**101.660**	**101.66**	**1.102**
STANDARD DEVIATION =			**3.914**	**CHI-SQUARE =**		**0.625**
Co-Efficient of Variance			**3.85**	**A=101.66**	**B=0.635**	

SOURCES: COMPILED FROM ANNUAL REPORTS AND ACCOUNTS

The value of chi-square figured at 0.625 is less than the critical value of 11.07 hence the null hypothesis is accepted and alternative hypothesis is rejected, which represented by straight line. The straight line showed a positive annual growth of 0.635, which shows the pattern of total productivity of this unit.

The table showed it clear that the input requirement per rupees of output was the lowest in 2001-2002. It is a good sigh of this company for that year in the case of total productivity.

(16) GRASIM TEXTILE IND. LTD.:-

Table No.-5.70 represented the total productivity and its analysis for Grasim Textile Ind. Ltd. for the covered by this study from 1997-98 to 2002-2003.

Table No.-5.70
Analysis of Overall Productivity Ratio in Grasim Textile Ind. Ltd. (IN CRORES)

YEAR	OUTPUT	INPUT	O/I	PROD. INDEX	TREND VALUE	I/O
1997-98	3499.84	3328.7	1.051	100	96.239	0.951
1998-99	3756.87	3715	1.011	96.194	97.407	0.988
1999-00	4272.62	4206.98	1.015	96.574	98.575	0.984
2000-01	4821.71	4287.33	1.124	106.945	99.743	0.889
2001-02	4372	4150.23	1.019	96.955	100.911	0.949
2002-03	4609	4458.54	1.033	98.287	102.079	0.967
TOTAL	**25332.04**	**24146.78**	**6.253**	**594.955**	**594.954**	**5.728**
AVE.	**4222.007**	**4024.463**	**1.042167**	**99.15917**	**99.159**	**0.95467**
STANDARD DEVIATION =			**3.71**	**CHI-SQUARE =**		**1.018**
Co-Efficient of Variance			**3.74**	**A=99.159**	**B=0.058**	

Sources: complied from annual reports of the companies

The table showed that output of this shows fluctuated trend. It ranged from the lowest of Rs.3499.84 in 1997-98 to highest 4821.71crores in 2000-2001. The average carries out to Rs.4222.007crores. The total input went up during the period of study. It was Rs.3328.70crores in 1997-98 to Rs.4458.54crores in 2002-2003 representing an increase by 133.94 percent.

The average input remained at Rs.4024.46crores. The rapid in total output rise in comparison to 133.94 percent since the total input expanded slowly as computed to the rise in output. The total productivity index varied from 100 in base year to 98.28 percent in 2002-03. The average index came out at 99.15 percent with a co-efficient of variation3.74 percent. The value of chi-square figured at 1.018 is less than the table value 11.07 hence null hypothesis is accepted.

TOTAL PRODUCTIVITY RATIOS OF SELECTED BIRLA GROUP OF COMPANY AND KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIATION TEST:-

Table No.-5.71 shows the comparative total productivity ratios in selected Birla Groups of Companies on the basis of Kruskal Wallis one-way analysis of variance test for the period of six years, which is under study.

TABLE NO.-5.71
TOTAL PRODUCTIVITY RATIOS OF SELECTED BIRLA GROUP OF COMPANY AND KRUSKAL WALLIS ONE-WAY ANALYSIS OF VARIATION TEST

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	1.08	**78**	0.885	**28**	0.763	**12**	0.881	**27**	0.971	**52**	0.192	**3**	1.24	**91**	0.84	16
1998-99	1.002	**62**	0.876	**24**	0.646	**8**	0.879	**26**	0.973	**54**	0.165	**2**	1.212	**90**	0.8	13
1999-00	0.993	**61**	0.803	**14**	0.898	**34**	0.875	**23**	0.97	**50**	0.144	**1**	0.863	**20**	0.76	10
2000-01	0.965	**47**	0.848	**17**	0.958	**44**	0.896	**32.5**	0.969	**49**	0.26	**5**	1.145	**88**	0.76	11
2001-02	1.031	**70**	0.886	**29**	0.874	**22**	0.892	**30**	0.982	**56**	0.27	**6**	1.134	**87**	0.6	7
2002-03	1.02	**69**	0.866	**21**	0.828	**15**	0.879	**25.5**	0.972	**53**	0.259	**4**	1.127	**85**	0.75	9
Total Rank		**386**		**133**		**135**		**164**		**313**		**21**		**461**		**66**

HIND	R9	TAX	R10	BPS	R11	BV.X.L	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
1.375	**92**	0.971	**52**	1.125	**84**	1.014	**65**	1.202	**89**	1.054	**77**	0.893	**31**	1.05	76
1.39	**94**	0.983	**58**	1.083	**79**	0.982	**55.5**	1.114	**82**	1.131	**86**	0.896	**32.5**	1.01	64
1.455	**95**	1.043	**74**	1.02	**69**	1.042	**73**	0.991	**60**	0.969	**49**	0.85	**18**	1.02	66
1.495	**96**	0.989	**59**	0.965	**47**	0.852	**19**	0.946	**41**	1.037	**72**	0.928	**39**	1.12	83
1.383	**93**	0.905	**36**	0.955	**42**	0.983	**57.5**	0.957	**43**	1.045	**75**	0.964	**45**	1.02	67
1.106	**81**	1.007	**63**	0.903	**35**	1.093	**80**	0.945	**40**	0.924	**38**	0.916	**37**	1.03	71
	551		**341**		**355**		**350**		**355**		**397**		**203**		**427**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk and
Ri=sum of the rank

$$K = \frac{12}{96(96+1)}\left[\frac{(386)^2}{6} + \frac{(133)^2}{6} + \frac{(135)^2}{6} + \frac{(164)^2}{6} + \frac{(313)^2}{6}\right.$$

$$\frac{(21)^2}{6} + \frac{(461)^2}{6} + \frac{(66)^2}{6} + \frac{(551)^2}{6} + \frac{(341)^2}{6}$$

$$\left.\frac{(355)^2}{6} + \frac{(350)^2}{6} + \frac{(355)^2}{6} + \frac{(397)^2}{6} + \frac{(203)^2}{6} + \frac{(427)^2}{6}\right] - 3(96+1)$$

= 0.00128865 (253269.72) –291

= 326.38 -291

= 35.37

Table No.-5.71 reveals that the calculated value of ' H' equal to 35.37 is more than the table value of 24.996 therefore the null hypothesis based on kruskal Wallis one way analysis of variance test at 5 percent level of significant is rejected and alternative hypothesis is accepted The rejection of hull hypothesis would mean that there is significant different between the total productivity ratios of the selected Birla group of company.

COMPARATIVE ANALYSIS OF OVERALL PRODUCTIVITY:-

Table No.-5.72 showed overhead ratio, co-efficiency of co-relationship, productivity index, average indices, trend value of indices, standard deviation, co-efficient of variation, chi-square and input output ratio for Birla group of companies

TABLE NO.- 5.72
COMPARATIVE ANALYSIS OF OVERALLODUCTIVITY

	OUTPUT -INPUT		PROD. INDEX		CO-EFFIT		CHI-SQUARE		INPUT-OUTPUT		GROWTH RATE		OVER ALL	
	AVE.		AVE.						AVE.				AVE.	
COMPANY	VAL.	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK	VAL.	RNK
CEMENT														

HYD.	1.015	**6**	93.99	**12**	3.309	**14**	0.621	**13**	0.985	**11**	-0.319	**10**	65	4
MYSORE	0.86	**13**	97.25	**11**	3.35	**13**	0.653	**11**	1.161	**4**	0.032	**8**	64	5
SHREE DIG.	0.827	**14**	108.5	**2**	12.21	**2**	7.193	**2**	1.226	**3**	2	**2**	24	16
BIRLA COR.	0.883	**12**	100.3	**5**	0.923	**15**	0.04	**15**	1.13	**5**	0.081	**5**	57	6
TEXTILES														
CENTURY TEX.	0.972	**10**	100.2	**6**	0.442	**16**	0.01	**16**	1.026	**7**	0.046	**7**	56	7
KESORAM.	0.215	**16**	112	**1**	23.3	**1**	17.24	**1**	4.921	**1**	5.699	**1**	27	15
INDIA RAYON	1.12	**2**	90.33	**13**	10.92	**3**	6.14	**3**	0.904	**15**	-0.595	**11**	43	12
AUTO & ALL.														
H.M.T.	0.749	**15**	89.57	**15**	9.823	**4**	3.011	**7**	1.347	**2**	-1.744	**14**	69	2
HINDALCO	1.367	**1**	99.44	**7**	9.112	**6**	3.723	**5**	0.737	**16**	-1.378	**13**	45	10
ENGINEERING														
TEXMACO LTD.	0.983	**9**	101.2	**4**	4.1	**10**	1.078	**8**	1.018	**8**	-0.158	**9**	49	9
B.P.&S	1	**7**	89.64	**14**	7.59	**7**	0.077	**14**	0.996	**10**	-1.967	**15**	72	1
WOOLLEN														
BIRLA VXL	0.994	**8**	98.05	**9**	7.443	**8**	3.184	**6**	1.01	**9**	0.29	**4**	41	14
TEA INDUSTY														
JAYSHREE TEA	1.025	**5**	85.34	**16**	9.56	**5**	0.924	**10**	0.981	**12**	-2.14	**16**	68	3
AGRO-IND														
ZUARI	1.026	**4**	97.41	**10**	6.4	**9**	5.169	**4**	0.977	**13**	-1.138	**12**	51	8
PAPER														
PAPER	0.907	**11**	101.7	**3**	3.85	**11**	0.625	**12**	1.102	**6**	0.635	**3**	43	12
DIVERSIFIED														
GRM	1.042	**3**	99.16	**8**	3.74	**12**	1.018	**9**	0.954	**14**	0.058	**6**	42	13
BIRLA GROUP	**0.937**		**97.75**		**7.254**		3.169		**1.28**		-0.37		**51**	

CONCLUSION:

As conclusion point of view chapter titled "Analysis of productivity" described the concept, importance and measurement of poductivity. The term productivity is using for interchangeably behavior and achievement, refers to ratio of output divided by input it is noted that "productivity improvement

concerns itself with the goals and objective of the organization as well as with the manner in which they are to be achieved, It involves both ' doing the right things' which is effectiveness but also ' doing them right' (efficiency)" [14] according to above Para it can be said that productivity concerned with to effectiveness and efficiency and it is a semi healthy parameter for measuring the performance of business organization.

REFERENCES:-

1. MOHANTY R.P. in his articles " managing technology for strategic advantages ", The Economics Times, (Thursday 9th jan.1992), p.14
2. THOMAS.K. CONNELL, How to Improve Human Performance (new York: Harper and row, 1978), p.3

3. BRAHMANANDA, P.R, productivity in the Indian Economy. (Bombay: Himalaya publishing House, 1982).
4. VADES FABRICANT' S introduction to J.W Kendrick' s Productivity Trends In The United States, (New York: N.B.E.R.1961), P.26
5. AGRAWAL, M.D. Efficiency Of Public Enterprise in India, (Jaipur: Prateekha Publication.1987), P.206
6. The Economics Times, (Thursday 9th jan.1992), p.13
7. SRIVASTAVA, J.P. Labour productivity, (new Delhi: oxford and I.H.B Publishing co.1982), p.35
8. Ibid.p.35
9. GORDAN, K.C.CHENAND ROBERT E. MCGARRAH, productivity management, (Chicago: The Dryden press, 1982), p.3
10. PRASAD, N.K., Cost accounting. (Calcutta: Book syndicate private ltd, 1979), pp, 20-25.
11. ROBERT. ANTHONY AND GLENN. A WEISCH, Management accounting, (House wood Illinois: Richard D.Irwin, 1977), pp.402-403
12. IVISON STEWART "Productivity measurement and the accountant" management accounting, London, vol.60 no.9, October 1982,p. No 20-23
13. JAIN A AND JAIN N. "An integrated approach to inventory management" Journal of accounting and Finance.Jaipur, Vol.12, No.2, Sep.1998, P.No.166
14. BROWN DAVID S. " Productivity of the professionals" productivity, New Delhi, Vol.XXIV, No.3, oct-dec.1983, p.241-249

CHAPTER – 6
ANALYSIS OF FINANCIAL EFFICIENCY

CONCEPT OF FINANCIAL EFFICIENCY:

Financial Efficiency is a measure of the organizations ability to translate to its financial resources into mission related activities. Financial Efficiency is desirable in all organisation of individual mission. It measures the intensity with which a business uses it assets to generate gross revenue and the effectiveness of producing purchasing, pricing, financing, and marketing decisions.

At the micro level, ' Financial Efficiency' refers to the efficiency with which resources are correctly allocated among competing uses at a point of time.

Financial Efficiency is a measure of how well an organisation has managed certain trade of (risk and return, liquidity and profitability) in the use of its financial resources.

Financial Efficiency is regarded as a measure of total efficiency and a management guide to greater efficiency and the extent of the profitability, productivity, liquidity and capital strength can be taken as a final proof of a Financial Efficiency. Financial Efficiency directed towards evaluating the liquidity, stability and profitability of a concern which put together of a concern.

The word efficiency as defined by the Oxford dictionary states that:
"Efficiency is the accomplishment of or the ability to accomplish a job with minimum expenditure of time and effort"

As expressed by Peter Drucker "Doing the things the right way is Efficiency." This denotes the fulfillment of the objective with minimum sacrifice of the available scarce resource."

Fantless and speedy compliance to the process or system procedure is a measure of efficiency providing a specified volume and quality of service with the lowest level of resources capable meeting that specification, performance

measures and or indicators are required. These include measures of productivity, unit of volume of service etc.

Concept of Profitability:

Profitability is the ability to earn profit from all the activities of an enterprise. It indicates how well management of an enterprise generates earnings by using the resources at its disposal.

In the other words the ability to earn profit e.g. Profitability, it is composed of two words ' profit' and ' ability' . The word ' profit' represents the absolute figure of profit but an absolute figure alone does not give an exact ideas of the adequacy or otherwise of increase or change in performance as shown in the financial statement of the enterprise. The word ' ability' reflects the power of an enterprise to earn profits, it is called earning performance. Earning is an essential requirement to continue the business. So we can say that a healthy enterprise is that which has good profitability.

According to Hermanson Edward and Salmonson "Profitability is the relationship of income to some balance sheet measure which indicates the relative ability to earn income on assets employed"[1]

Profit and Profitability:

Profits are the cream of the business without it may not serve the purpose its true that "profits are useful intermediate beam towards which capital should be derected"[2] Weston and Brigham mentioned that "To the financial management profit is the test of efficiency and a measure of control, to the owners a measure of the worth of their investment, to the creditors the margin of safety, to the government a measure of taxable capacity and a basis of legislative action and the country profit is an index of economic progress national income generated and the rise in the standard of living".[3] While profitability is an outcome of profit. In the other words no profit derived towards profitability. "It may be remarked that the profit making ability might denote a constant or improved or deteriorated state of affairs during a given period, Thus, profit is an absolute connotation where as profitability is a

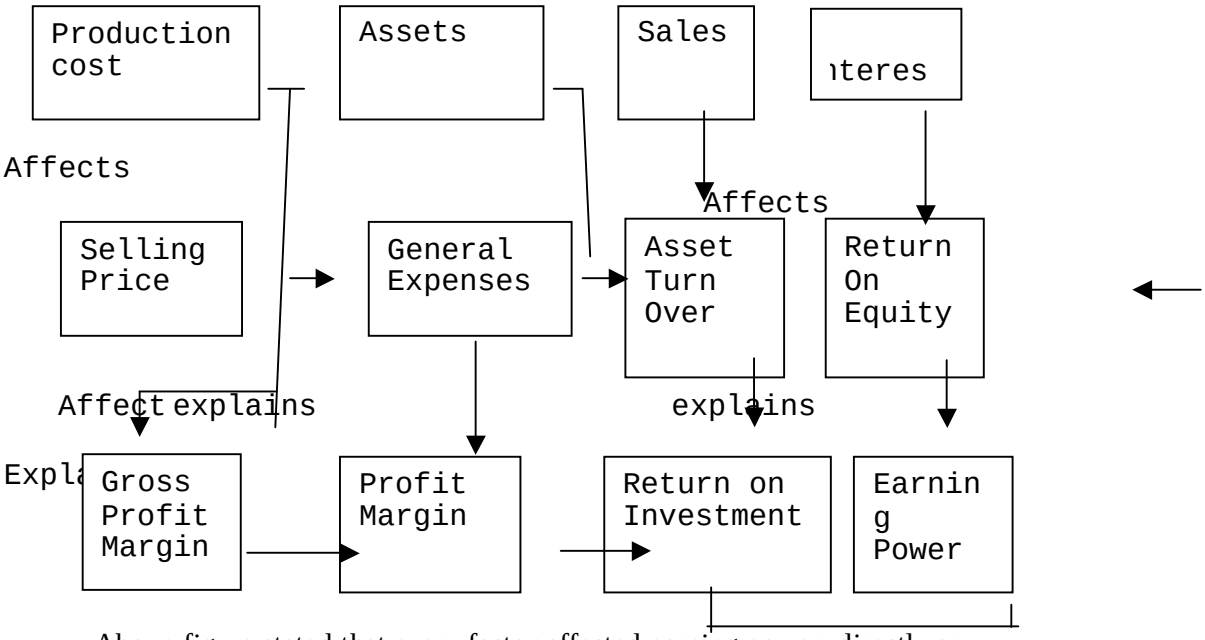
relative concepts."[4] Profit and profitability are two different concepts, although they are closely related and mutually independent, playing distinct role in Business. R.S.Kulshrestha mentioned that "Profit in two separate business concerns might be the same and yet more often they note their profitability could differ when measured in terms of the size of investment" [5] As outcome of above statement it can be said that profitability is broader concept comparing to the concept of profit levels of profitability helps in establishing quantitative relationship between profit and level of investment or sales.

Measurement Tool of Profitability:

For making policy decision under different situations, measurement of profitability is essential. According to Murthy V.S. "The most important measurement of profitability of a company is ratio e.g. profitability of assets, variously referred to as earning power of the company, Return on total investment or total resources committed to operations.[6] profitability ratios are calculated to measure the operating efficiency of the firm. According to Block and Hirt "The income statement is the major device for measuring the profitability of a firm over a period of time."[7] Measurement of profitability is as essential as the earning of itself for the business concern. Some managerial decision like rising of additional finance, further expansion, problems of bonus and dividend payments rest upon this measurement. It can be measured for a short term and as well as for a long term. The relation to sales is the good short-term indication of successful growth while profitability in relation to investment is the healthier for long growth of the business. Profitability provides overall performance of a company and useful tool for forecast measurement of a company's performance. "The overall objective of a business is to earn a satisfactory return/profit on the funds invested in it, while maintaining a sound financial position profitability measures financial success and efficiency of management.[8]

The importance of analysis of profitability performance can be seen from the reality that besides the management and owners of the company, financial institutions, creditors, bankers also look at its profitability. Appraisal of performance as regards to profitability can be drawn from interpreting various ratios. However there are few factors affected to the firm's profitability. Each factor in turn will affect the profitability ratio. Diagram No.-6.1, describes factors that affect of different profit ratios and shows which ratio relates to explain other ratios.

Diagram No.- 6.1
Factors Affecting to Profitability Ratio



Above figure stated that every factor affected earning power, directly or indirectly. The reason is one ratio explains to another. In present study profitability ratios can be measured through two group i.e. (1) profitability ratios in relation to capital employed. The examples of sales based profitability ratio are net profit ratio, operation ratio and gross profit ratio and in relation to capital employed and Return on owners equity of the company will be discussed below:

(I) Profitability Ratio in Relation to Sales

(1) Gross Profit Ratio:-

"The excess of the net revenue from sales over the cost of Merchandise sold is called gross profit, gross profit on sales or gross margin."[9]

This ratio calculated by dividing gross profit by net sales and is usually expressed as a percentage. The formula of gross profit ratio is given below:

$$\text{GROSS PROFIT RATIO} = \frac{\text{SALES -- COST OF GOODS SOLD}}{\text{SALES}} \times 100$$

The gross profit ratio highlights the efficiency with which management produces each unit of products as well as it indicates the average spread between the cost of goods sold and the sales revenue. Any fluctuation in the gross profit ratio is the result of a change in cost of goods sold or sales or both. A high gross profit ratio is a mark of effectiveness of management. The gross profit ratio may increase due to any of the below factors.

(1) Lower cost of goods sold where sales prices remaining constant.

(2) Higher sales prices where cost of goods sold remaining constant.

(3) An increase in the proportionate volume of higher margin items

(4) A combination of variations in sales prices and costs. While in the case of low profit ratio it may be reflected higher cost of goods sold due to firms' inability to purchase at favourable terms, over investment in plant and machinery etc. Secondly this ratio will also be low due to a decrease in price in the market.

The Goss Profit Ratio of Birla Group of Companies of selected units was given in the Table No.-6.1. The Table showed gross profit ratio of Birla Group of Companies. The ratio showed declined trend with an average of 19.55 percent. The ratio varied from 16.49 percent in 2002-03 to 21.16 percent in 1997-98. The gross profit ratio was good and satisfactory.

Table showed the gross profit ratio in relative terms as percent of net sales. As regards the Hyderabad Cement Ltd. the gross profit ratio ranged from 15.96 percent in 2000-01 to 22.85 percent in 2002-03. It showed overall fluctuated trend during the research study with an average of 21.07.

Table No.- 6.1
Gross Profit Ratio of Birla Group of Companies
From 1997-98 to 2002-03(In Percent)

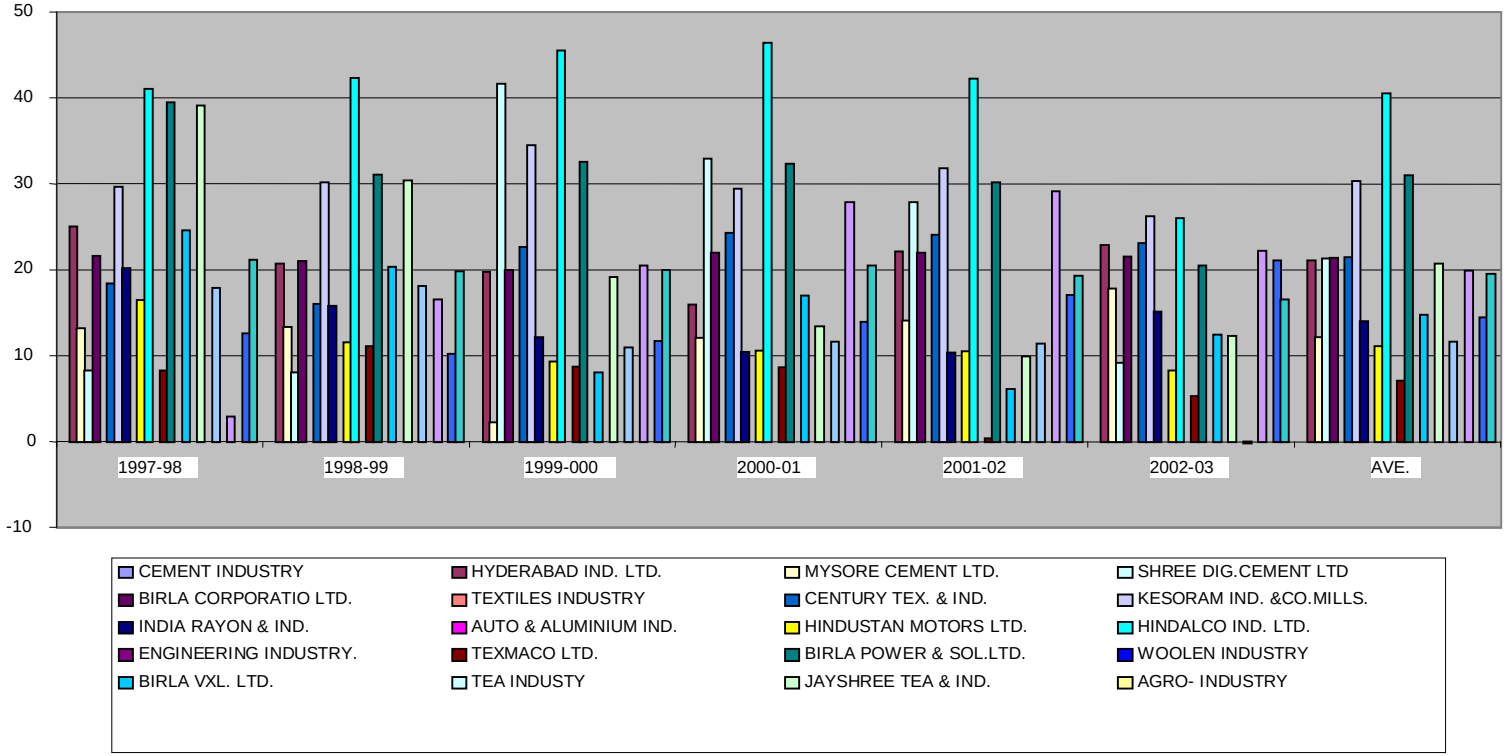
COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	25.04	20.71	19.79	15.96	22.09	22.85	**21.07**
MYSORE CEMENT LTD.	13.17	13.31	2.27	12.068	14.09	17.74	**12.11**
SHREE DIG.CEMENT LTD	8.27	8.06	41.62	32.89	27.85	9.16	**21.31**
BIRLA CORPORATIO LTD.	21.61	21.03	19.95	21.98	22.01	21.59	**21.36**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	18.43	16.06	22.72	24.27	24.05	23.09	**21.44**
KESORAM IND. &CO.MILLS.	29.71	30.2	34.5	29.43	31.8	26.29	**30.32**
INDIA RAYON & IND.	20.14	15.86	12.13	10.4	10.37	15.13	**14.01**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	16.44	11.54	9.34	10.57	10.54	8.28	**11.12**
HINDALCO IND. LTD.	40.99	42.29	45.49	46.37	42.19	25.95	**40.55**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	8.27	11.14	8.77	8.7	0.39	5.36	**7.101**
BIRLA POWER & SOL.LTD.	39.47	31.1	32.55	32.32	30.17	20.54	**31.02**
WOOLEN INDUSTRY							
BIRLA VXL. LTD.	24.55	20.33	8.09	17.04	6.061	12.42	**14.74**
TEA INDUSTY							
JAYSHREE TEA & IND.	39.11	30.37	19.22	13.44	9.96	12.35	**20.74**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	17.84	18.15	10.93	11.62	11.46	-0.147	**11.64**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.9	16.54	20.51	27.84	29.14	22.18	**19.85**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	12.65	10.27	11.7	13.95	17.09	21.11	**14.46**
BIRLA GROUP	21.16	19.81	19.97	20.55	19.32	16.49	**19.55**

SOURCE: ANNUAL REPORTS AND ACCOUMTS FROM 1997-98 TO 2002-03

In this ratio the management is very much interested. In Mysore Cement Ltd. the gross profit ratio showed fluctuated trend during the study period of time. It ranged between 2.27 percent in 1999-2000 to 17.74 percent in 2002-03. With an average of 12.11 percent except in 1999-2000, and in 2000-01 the gross profit ratio were below the average ratio. The gross profit ratio of Shree Digvijay Cement Ltd. indicates the fluctuated trends during the research period. The ratio ranged from 8.06 percent in 1998-99 to 41.62 percent 1999-2000 with an average of 21.31 percent. In first two years and last year of Study period the cost of production were increased due to the inflation

Graph No :-6.1

Gross Profit Ratio



in the price of raw materials. In the Birla Corporation Ltd. the gross profit ratio had been on an average 21.36 percent ranging from 19.95 percent in 1999-2000 and 21.98 percent in 2000-01.with a fluctuated trend. Thus the average gross profit ratio was equal in all five selected cement industries. The Century Textile Ltd. had an average ratio of 21.43 ranging from 16.06 percent in 1998-99. to 23.0 percent in 2002-03. The ratio showed increased trend except in the year of 1998-99. The gross profit ratio of Kesoram Ind Ltd. showed fluctuated trend during the study period of time with an average of 30.32 percent. The company had successfully controlled the cost of production because the ratio ranged between 26.29 percent in 2002-03 and 34.50 percent in 1999-2000. In Indian Rayon the ratio varied from 10.37 percent 2001-02 to 20.14 percent in 1997-98 with an average of 14 percent. It continued showing a fluctuated trend. In the last year the ratio is above than average. In the textile industries of Birla Group of Companies the highest average ratio is 32.32 of Kesoram Ind. Ltd.

The Hindustan Motor Ltd. showed fluctuated trend of gross profit ratio ranging from 8.27 percent in 2002-03 and 16.44 percent in 1997-98. The average ratio is 11.11 percent. The Hindalco Industries Ltd. indicated the gross profit ratio ranged from 25.95 percent in 2002-03 and 46.37 percent in 2000-01 with an average ratio of 40.55 percent. It showed mixed trends of gross profit ratio of Hindustan Motor Ltd.

In Engineering Ind., The Texmaco Ind. Ltd. had an average ratio is 7.11 percent. The ratio ranged between 0.39 percent in 2001-02 and 11.14 percent in 1998-99. It showed the declined trend. In Birla Power Solution Ltd. the ratio was satisfactory but it showed slight fluctuated trend. It ranged from 19.95 percent in 1999-2000 and 21.98 percent in 2000-01. The average being 21.36 percent. In engineering industry, The Birla Power & Solution showed highest average ratio.

In the woolen industry 1999-2000 with an average of 10.03, The Birla VXL Ltd. had an average gross profit ratio was 14.76 percent ranging from

6.061 percent in 2001-02 and 24.55 percent in 1997-98. The gross profit ratio displayed highly fluctuated trend through out the research study. Over all The Birla VXL Ltd. had the highest average ratio.

In tea industry the Jay Shree Tea & Ind. Ltd. had an average ratio 20.74 percent. It varied from 9.96 percent in 2001-02 and 39.11 percent in 1997-98. The ratio showed downward trend.

Zuari Ind. Ltd. showed fluctuated trend. It varied from -0.147 percent in 2002-03 and 18.15 percent in 1998-99. The average ratio was 11.64 percent.

The Orient Paper Ltd. showed increased trend up to 2001-02 but then after declined. However it varied from 16.54 percent 1998-99 and 29.14 percent in 2001-02 with an average of 19.85 percent.

The Grasim Ind. Ltd. had an average ratio 14.46 percent ranging from 10.27 percent in 1998-99 to 21.11 percent 2002-03 and progressive trend.

On the basis of above analysis it can be said that the Hindalco Ind. Ltd. has the highest gross profit ratio followed by Birla Power & Solution, Kesorama Ind. Ltd., Century Textiles Ltd., Birla Corporation Ltd., Oreint Paper Ltd. and Hyderabad Cement Ltd. These companies have the average ratio more than the Birla Group of Companies.

The Indian Rayon & Ind., Mysore Cement Ltd., Hindustan Motor Ltd. and The Zuari Ind. Ltd. all these companies have the average ratio below the combined average ratio of Birla Group of Companies.

Gross Profit Ratio Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between gross profit ratio of Birla Group of Companies

Alternative Hypothesis: There is significant difference between gross profit ratio of Birla Group of Companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-6.1.1
The Comparative Position of Gross Profit Ratios of Birla Group of Companies along with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RAYON	R7	HML	R8
1997-98	25.04	72	13.2	33	8.27	9.5	21.61	61	18.43	49	29.7	79	20.14	53	16.44	42
1998-99	20.71	57	13.3	34	8.06	7	21.03	58	16.06	41	30.2	81	15.86	39	11.54	25
1999-00	19.79	51	2.27	3	41.6	92	19.95	52	22.72	66	34.5	88	12.13	29	9.34	15
2000-01	15.96	40	12.1	28	32.9	87	21.98	62	24.27	70	29.4	78	10.4	19	10.57	21
2001-02	22.09	64	14.1	37	27.9	76	22.01	63	24.05	72	31.8	84	10.37	18	10.54	20
2002-03	22.85	67	17.7	46	9.16	14	21.59	60	23.09	68	26.3	74	15.13	38	8.28	11
Total		**351**		**181**		**285.5**		**356**		**366**		**484**		**196**		**134**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	PAPER	R15	GRAS	R16
40.99	91	8.27	9.5	39.5	90	24.55	71	39.11	89	17.8	47	2.9	4	12.65	32
42.29	94	11.1	23	31.1	83	20.33	54	30.37	82	18.2	48	16.54	43	10.27	17
45.49	95	8.77	13	32.6	86	8.09	8	19.22	50	10.9	22	20.51	55	11.7	27
46.37	96	8.7	12	32.3	85	17.04	44	13.44	35	11.6	26	27.84	75	13.95	36
42.19	93	0.39	2	30.2	81	6.06	6	9.96	16	11.5	24	29.14	77	17.09	45
25.95	73	5.36	5	20.5	56	12.42	31	12.35	30	-0.1	1	22.18	65	21.11	59
	542		**64.5**		**481**		**214**		**302**		**168**		**319**		**216**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk Ri=sum of the rank

$$K = \frac{12}{96(96+1)}\left[\frac{(351)^2}{6} + \frac{(181)^2}{6} + \frac{(285.5)^2}{6} + \frac{(356)^2}{6} + \frac{(366)^2}{6} \right.$$

$$\frac{(484)^2}{6} + \frac{(196)^2}{6} + \frac{(134)^2}{6} + \frac{(542)^2}{6} + \frac{(64.5)^2}{6}$$

$$\left. \frac{(481)^2}{6} + \frac{(214)^2}{6} + \frac{(302)^2}{6} + \frac{(168)^2}{6} + \frac{(319)^2}{6} + \frac{(216)^2}{6} \right] - 3(96+1)$$

= 0.00128865 (271953.10) –291

= 350.452 -291

= 59.45

Table No.-6.1.1 indicated that the calculated value of H works out 59.45, being more than the critical value of 24.996 Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It is concluded that there has been significant difference between gross ratios of the regions.

(2) Operating Ratio:

Operating Ratio matches the cost of goods sold plus other operating expenses on the one hand, with net sales, on the other the operating expenses consist of the following

1. Selling and distribution expenses, like salaries of salesmen, advertising and traveling expenses.
2. Administration expenses like rent, insurance, salaries of office clerks, directors' fees, legal expenses etc. in the form of formula it can be expressed as follows:

$$\text{Operating Ratio} = \frac{\text{Cost of Goods Sold + Operating Expenses}}{\text{Net Sales}} \times 100$$

A higher operating ratio expenses ratio is unfavoirable. To get the comprehensive idea of the behaviour of operating expenses variations in the ratios over a number of years should be studied. The variations in the ratio temporary or long lived can occur due to several factors such as changes in the sales prices.

The Table No.-6.2 revealed the operating ratio of Birla Group of Companies, which showed fluctuated trend during the study period. The average ratio was 101.63 percent which was not satisfactory. The ratio varied from 96.77 percent in 1997-98 to 103.48percent in 1999-2000. The ratio was not good except in 1997-98.

From the above table no.- 6.2 that during the period of 1997-98 to 2002-03 the operating ratio in Hyderabad Cement Ltd. fluctuated trends. The ratio was highest 107.99 percent in 2000-01.

In the first three years of study period the ratio showed increased trends. In the last two years of study period the ratio decreased that showed the management was able to control over the cost of goods sold and administrative expenses.

In Mysore Cement Ltd. the operating ratio had been on an average 114.19 percent ranging from 127.77 percent in 1999-2000 to 108.38 percent in 2002-03. The average ratio was more than the Birla Group of Companies. In last three years it showed a decreased trend. The operating ratio was more than the standard ratio 75 to 85 percent.

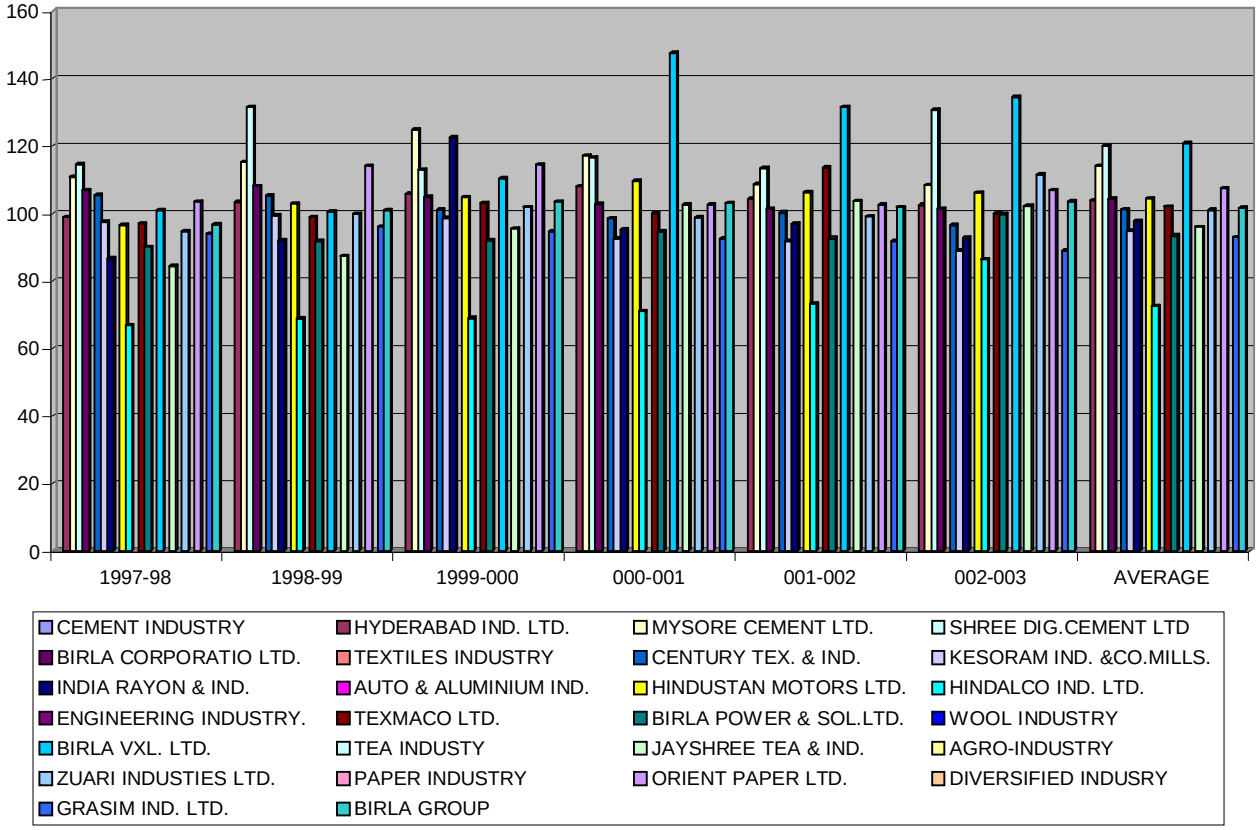
Table No.- 6.2
OPERATING RATIO OF BIRLA GROUP OF COMPANIES FROM 1997-98 TO 2002-03 (In percent)

COMPANY	**1997-98**	**1998-99**	**1999-00**	**2000-01**	**2001-02**	**2002-03**	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	98.84	103.4	105.77	107.99	104.18	102.57	103.79
MYSORE CEMENT LTD.	110.81	115.21	124.77	117.22	108.76	108.38	114.19
SHREE DIG.CEMENT LTD	114.54	131.4	112.86	116.54	113.31	130.66	119.89
BIRLA CORPORATIO LTD.	106.78	108.11	104.88	102.83	101.29	101.29	104.19
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	105.47	105.38	101.05	98.45	100.24	96.59	101.19
KESORAM IND. &CO.MILLS.	97.48	99.47	98.61	92.42	91.83	88.86	94.78
INDIA RAYON & IND.	86.57	91.89	122.5	95.16	96.914	92.7	97.62
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	96.58	102.87	104.76	109.55	106.27	106.05	104.35
HINDALCO IND. LTD.	66.88	68.73	68.89	70.92	73.26	86.31	72.49
ENGINEERING INDUSTRY.							
TEXMACO LTD.	97.03	98.84	103.05	100	113.55	99.95	102.07
BIRLA POWER & SOL.LTD.	90.06	91.7	91.89	94.59	92.57	99.79	**93.433**
WOOL INDUSTRY							
BIRLA VXL. LTD.	100.85	100.51	110.24	147.58	131.36	134.42	**120.83**
TEA INDUSTY							
JAYSHREE TEA & IND.	84.41	87.28	95.41	102.69	103.65	102.29	**95.95**
AGRO-INDUSTRY							
ZUARI INDUSTIES LTD.	94.64	99.88	101.86	98.71	99.08	111.54	**100.95**
PAPER INDUSTRY							
ORIENT PAPER LTD.	103.47	114.02	114.52	102.72	102.62	106.8	**107.36**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	93.97	96.06	94.61	92.42	91.83	88.86	**92.96**
BIRLA GROUP	**96.77**	**100.92**	**103.48**	**103.11**	**101.92**	**103.57**	**101.63**

Source: Computed Annual Reports and Accounts from 1997-98 to 2002-03

Graph No :-6.2

Operating Ratio



In Shree Digvijay Cement Ltd. the operating ratio had been on an average 119.89 percent ranging from 131.41 percent in 1998-99 to 113.31 percent in 2001-02 showing fluctuated trends through out the study period. The average ratio was more than the Birla Group of Companies. In most of the year the operating was more than standard ratio 75 to 85.

Birla Corporation Ltd. had an average operating ratio of 104.20 percent ranging from 101.29 in 2002-03 to 108.11 percent in 1998-99. It evidenced decreased trends. The average ratio was more than the Birla Group of Companies.

In Century Textiles & Ind. Ltd. the ratio varied from 96.59 percent in 2002-03 to 105.7 percent in 1997-98 constituting a range of 102.20 percent of average. The average ratio was less than the Birla Group of Companies. On the basis of average it can be inferred that the ratio had marked a failing trend during the period of study.

Kesoram Ind. Ltd. and showed the operating ratio was aggregately decreased from 96.98 percent in 2000-01 to 96.70 percent in 2001-02. In the last year the ratio was increased 97.17 percent in 2002-03. The average was 97.67 percent during the period of study.

In Indian Rayon & Ind. Ltd., the ratio had been on an average 96.61 percent ranging from 86.57 percent in 1997-98 to 122.50 percent in 1999-2000. The ratio showed fluctuated trends. But in 1999-2000 the operating ratio had been more than 100 percent and the company' s operating has also given loss. In most of the years the ratio more than of standard ratio 75 to 85 percent

In Hindustan Motor Ltd. the operating ratio showed mix and increased trends varied from 96.58 percent in 1997-98 to 109.55 percent in 2000-01. During 1997-98 to 2000-01 it showed increased trends. Then in last years two years it declined

In Hindalco Ind. Ltd., had an average operating of 75.50 percent ranging from 66.88 percent in 1997-98 to 86.31 percent in 2002-03. It evidenced increased trends.

Texmaco Ltd. showed fluctuated trends of operating ratio. The average ratio was 102.07 percent. The ratio ranged between 99.55 percent in 2002-03 and 113.55 percent in 2001-02. In last years the ratio decreased which indicated the good sign of control of management over expenses.

In Birla Power and Solutions Ltd. the operating ratio had been on an average 93.43 percent. The ratio explained mix and increased trends. The ratio ranged from 90.06 percent in 1997-98 and 99.79 percent in 2002-03. The ratio was more than standard ratio.

In case of Birla VXL Ltd. the operating ratio had been 100.51 percent in 1998-99 to 147.58 percent in 2000-01. The ratio showed upward trends for first four years. Then it showed mixed trends. In most of the years the ratio was more than 100 percent, which showed, the company had loss.

In Jay Shree Tea & Ind. ltd., the operating ratio was aggregately increased 84.41 percent in 1997-98 to 103.65 percent in 2001-02 with an average of 95.96 percent. In last three years the ratio showed more than 100 percent, which indicated that the company had loss for three years.

In Zuari Ind. Ltd., the operating ratio showed mix fluctuated trend with an average of 100.95 percent varied from 94.64 percent in 1997-98 to 111.54 percent in 2002-03.

In Orient Paper Ltd., during study period of 1997-98 to 2002-03 the operating ratio showed highest 114.02 percent in 1998-99. In first three years it showed upward trends but then it decreased in the last three years.

In Grasim Ind. Ltd. the operating ratio had been on an average 92.96 percent ranging from 88.86 percent in 2002-03 to 96.06 percent in 1998-99 and showed decreased trends in the subsequent years. But in last years the ratio showed improved trends.

On the whole it can be seen that the highest average ratio seen in 114.19 percent Mysore Cement Ltd. While lowest ratio seen in the Hindalco Ind. Ltd. 72.50. A higher operating ratio is unfavourable for the company.

Further it can be said that Hindalco Ind. Ltd. has achieved good remarks in the case of operating ratio.

Operating Ratio Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between operating ratio of Birla Group of Companies

Alternative Hypothesis: There is significant difference between operating ratio of Birla Group of Companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-6.2.1

The Comparative Position of Operating Ratio of Birla Group of Companies along with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	Ryn	R7	HML	R8
1997-98	98.84	37	110.81	79	114.54	86	106.78	71	105.47	67	97.48	33	86.57	8	96.58	29
1998-99	103.4	60	115.21	87	131.4	94	108.11	74	105.38	66	99.47	40	91.89	16	102.87	58
1999-00	105.77	68	124.77	91	112.86	81	104.88	65	101.05	48	98.61	35	122.5	90	104.76	64
2000-01	107.99	73	117.22	89	116.54	88	102.83	57	98.45	34	92.42	18	95.16	26	109.55	77
2001-02	104.18	63	108.76	76	113.31	82	101.29	49.5	100.24	45	91.83	14	96.91	31	106.27	70
2002-03	102.57	53	108.38	75	130.66	92	101.29	49.5	96.59	30	88.86	10	92.7	13	106.05	69
Total		**354**		**497**		**523**		**366**		**290**		**150**		**184**		**367**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
66.88	**1**	97.03	**32**	90.06	**12**	100.85	**47**	84.41	**6**	94.64	**25**	103.47	**61**	93.97	**22**
68.73	**2**	98.84	**37**	91.7	**13**	100.51	**46**	87.28	**9**	99.88	**42**	114.02	**84**	96.06	**28**
68.89	**3**	103.05	**59**	91.89	**16**	110.24	**78**	95.41	**27**	101.86	**51**	114.52	**85**	94.61	**24**
70.92	**4**	100	**44**	94.59	**23**	147.58	**96**	102.69	**52**	98.71	**36**	102.72	**56**	92.42	**18.5**
73.26	**5**	113.55	**83**	92.57	**20**	131.36	**93**	103.65	**62**	99.08	**39**	102.62	**54**	91.83	**14.5**
86.31	**7**	99.95	**43**	99.79	**41**	134.42	**95**	102.29	**52**	111.54	86	106.8	**42**	88.86	**10.5**
	22		**298**		**125**		**455**		**208**		**279**		**382**		**117.5**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk Ri=sum of the rank

$$K = \frac{12}{96(96+1)}\left[\frac{(354)^2}{6} + \frac{(497)^2}{6} + \frac{(523)^2}{6} + \frac{(366)^2}{6} + \frac{(290)^2}{6}\right.$$

$$\left.\frac{(150)^2}{6} + \frac{(184)^2}{6} + \frac{(367)^2}{6} + \frac{(22)^2}{6} + \frac{(298)^2}{6}\right.$$

$$\left.\frac{(125)^2}{6} + \frac{(455)^2}{6} + \frac{(208)^2}{6} + \frac{(279)^2}{6} + \frac{(382)^2}{6} + \frac{(117.5)^2}{6}\right] - 3(96+1)$$

$$= 0.00128865 \quad (274621.375) - 291$$

$$= 353.890 - 291 \qquad = 62.890$$

Table No.-6.2.1 showed the calculated value of ' H' work out at 62.890, which is more than the critical value of 24.996. Hence, the rejection of the null hypothesis is based on Kruskal Wallis' s analysis of variance test. The rejection of null hypothesis would indicate that there is significance different among the operating ratio of Birla Group of Companies.

(3) Net Profit Ratio:-

Net Profit Ratio is obtained when operating expenses; interest and taxes are subtracted from the gross profit. It indicates that the proportion of sales is left to the proprietors after all costs; charges and expenses have been deducted

Net Profit Ratio is differing from the operating ratio to sales ratio in as much as it computed after adding non- operating surplus/deficit. (Difference of non-operating income and non-operating expenses) The net profit ratio is measured by dividing profit after tax by net sales.

$$\text{Net Profit Ratio} = \frac{\text{Profit after Tax}}{\text{Net Sales}} \times 100$$

Net Profit Margin Ratio establishes relationship between net profit and sales and it indicates management efficiency in administering, manufacturing and selling the products. This ratio is the overall measure of the firm' s ability to turn each rupees sale in to net profit. While the net profit is anadequate, the firm will fail to achieve satisfactory return on owner' s equity, due to various reasons. Such as (1) falling price (2) Rising costs and declining sales.[10] thus,

this ratio is very useful to the proprietors and widely used as a measure of overall profitability

A high net profit ratio would ensure adequate return to the owners as well as enable a firm to withstand adverse economic conditions when the selling price declining, the cost of production is rising and demand for the products is falling.[11]

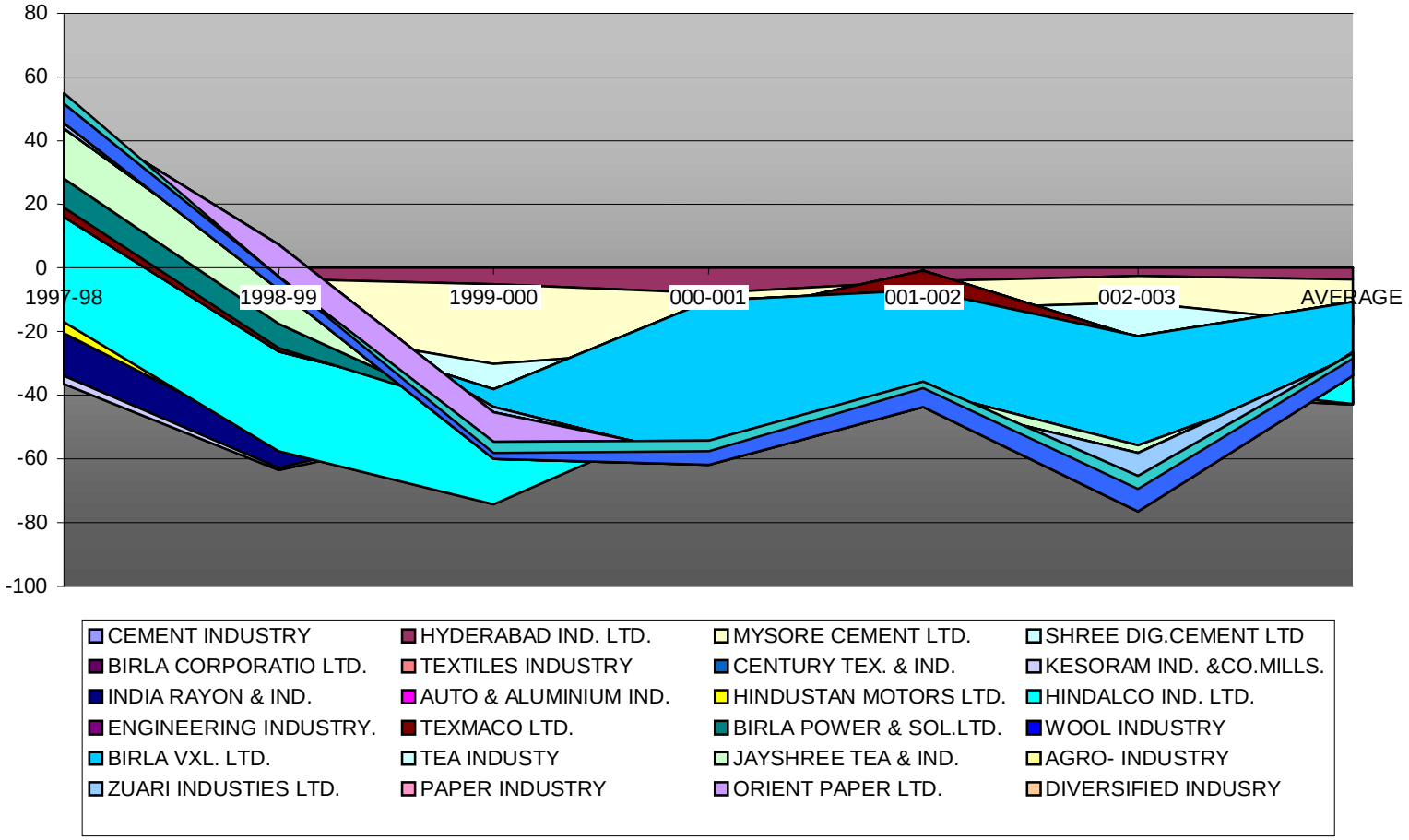
Table No.-6.3
Net Profit Ratio of Birla Group of Companies
From 1997-98 to 2002-03 (In percent)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.16	-3.4	-5.27	-7.99	-4.18	-2.57	**-3.71**
MYSORE CEMENT LTD.	-10.81	-15.21	-24.77	-17.22	-8.76	-8.38	**-14.19**
SHREE DIG.CEMENT LTD	-14.54	-31.41	-12.86	-16.54	-13.31	-30.66	**-19.89**
BIRLA CORPORATIO LTD.	-6.78	-8.11	-4.88	-2.83	-1.29	-1.29	**-4.19**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	-5.47	-5.38	-1.05	1.55	-0.24	3.41	**-1.19**
KESORAM IND. &CO.MILLS.	2.52	0.53	1.79	3.02	3.3	2.83	**2.33**
INDIA RAYON & IND.	13.43	8.16	-22.5	4.84	3.086	7.3	**2.39**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	3.42	-2.87	-4.76	-9.55	-6.27	-6.05	**-4.35**
HINDALCO IND. LTD.	33.12	31.27	31.11	29.08	26.74	13.69	**27.5**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	2.97	1.16	-3.05	0	-13.55	0.05	**-2.07**
BIRLA POWER & SOL.LTD.	9.94	8.3	8.11	5.41	7.43	0.21	**6.57**
WOOL INDUSTRY							
BIRLA VXL. LTD.	-0.85	-0.51	-10.24	-47.58	-31.36	-34.42	**-20.83**
TEA INDUSTY							
JAYSHREE TEA & IND.	15.59	12.72	4.59	-2.69	-3.65	-2.29	**4.05**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	5.36	12	-1.86	1.29	0.92	-11.54	**1.03**
PAPER INDUSTRY							
ORIENT PAPER LTD.	-3.47	-14.02	-14.52	-2.72	-2.62	-6.8	**-7.36**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	6.03	3.94	5.39	7.58	8.17	11.14	**7.04**
BIRLA GROUP	**3.23**	**-0.18**	**-3.42**	**-3.39**	**-2.22**	**-4.09**	**-1.68**

Source: Annual Reports and Accounts from 1997-98 to 2002-03

Graph No :-6.3

Net Profit Ratio



The Table No.-6.3 showed net profit ratio of Birla Group of Companies. The ratio showed negetive in most of the years. The Birla Group' s financial efficiency was not satisfactory

The net profit ratio of Hyderabad Ind. Ltd. ranged between (-)7.99 percent in 2000-01 and 1.16 percent in 1997-98. After the first year of study period the net profit ratio was negative. In 1998-99 the ratio was (-) 3.4 then it declined to (-) 5.99 percent in 1999-2000. It was (-) 7.99 percent in 2000-01. The net profit ratio also decreased in last two years. The average ratio was (-) 3.71.The decreased net profit ratio affected negetive on share' s price.

In Mysore Cement Ltd. the net profit ratio was negative in all the years of study period of time with an average of 14.19 percent. The ratio ranged between (-) 24.77 percent in 1999-2000 and (-) 8.38 percent in 2002-03. The declined trend was dangerous for the stakeholders.

The above table showed net profit ratio of Shree Digvijay Ind. Ltd. The net profit ratio in 1997-98 was (-) 14.54 percent. It was (-) 13.41 in 1998-99. The average ratio was (-) 19.89 percent. In most of years the ratio was negative. The company had a loss in all the year. The management was not able to curb the manufacturing, selling and financial expenses.

In Birla Corporation Ltd. the net profit ratio showed negetive trends through out the year. It was (-) 6.78 percent in 1997-98. Then the increased and ratio was (-) 8.11 percent 1998-99. Then the loss slightly decreased and the ratio in 1999-2000 (-) 4.88 percent and in 2000-01 (-) 2.83 percent. In the last two years of study period of time the ratio was negetive. The average ratio was (-) 4.196 percent. The negetive ratio did not show a good sigh of success of company.

Century Textiles & Ind. Ltd. the table no.-6.3 showed the net profit in relative terms as a percent of net sales. In Century Textiles & Ind. Ltd. the ratio ranged between (-)5.47 percent and 3.41 percent in 2002-03 with an average of (-) 1.19 percent. In 1997-98 the ratio was negetive (-) 5.47 percent. It was also negetive after two years. Then after it was 1.55 percent in 2000-01. In the final

year of study period of time it increased and was positive 3.41 percent. The trend was fluctuated.

In Kesoram Ind. Ltd. the net profit ratio ranged between 0.53 percent in 1998-99 and 3.30 percent in 2002-03 with an average of 2.33 percent. The net profit ratio showed a fluctuated trend. In 1997-98 the ratio was 2.52 percent. Then after three consecutive years it showed increased trends. But in the final years of study period it declined to 2.83 percent. However the company maintained the net profit through out the research period except in the year of 1998-99 it was 0.53 percent

The net profit ratio of Indian Rayon & Ind. Ltd. showed a fluctuated trend. The ratio varied from 13.43 percent in 1997-98 to (-) 22.50 percent in 1999-2000 with an average of 2.39 percent. The trend was mix and decreased.

The Hindustan Motor Ltd. showed net profit ratio in 1997-98 3.42 percent. The ratio declined to (-) 2.87 percent in 1998-99. The ratio ranged between (-)9.55 percent in 2000-01and 3.42 percent in 1997-98 with an average of (-)4.35 percent. The trend was fluctuated throughout the study period of time. In most of years the ratio was negative.

The net profit ratio of Hindalco Ind. Ltd. ranged between 8.28 percent in 2002-03.and 14.61 percent in 1999-2000. In the first three years the net profit ratio showed constant trend. Then after it showed declined trend in the final three years. The average ratio was 27.84 percent, which is better than other selected units.

The above table revealed the data regarding the Texmaco Ltd. the net profit ratio was 2.97 in 1997-98. The ratio declined 1.16 percent in 1998-99.In 1999-2000 the ratio was negative. But in the final year of study period it was slight increased to 0.05 percent. However, the ratio ranged between 0 percent in 2000-2001 to 2.97 percent in 1997-98.with an average of (-) 2.07 percent.

The net profit ratio of Birla Power and Solutions showed the trend was decreasing. The average ratio was 6.57 percent. The ratio varied from 0.21 percent on 2002-03 to 9.94 percent in 1997-98.

The net profit ratio of Birla VXL Ltd. was also negative in most of the years. The ratio varied from (-) 47.58 percent in 2000-01 to (-) 0.51 percent in 1998-99 with an average of (-) 20.83 percent. The ratio showed fluctuated trends. The net profit ratio in Jay Shree Tea & Ind. ltd. ranged between (-) 3.65 percent in 2001-002 and 15.59 percent in 1997-98. Net profit ratio was highest 15.59 percent. It showed declined trend from 1998-99 to 2002-03. In the final year of study period the ratio was negative (-) 2.29 percent. The net profit ratio showed more fluctuated trend in the last three year of study period. The average ratio was 4.05 percent.

The net profit ratio of Zuari Ind. Ltd. varied from (-) 11.54 percent in 2002-03 to 5.36 percent in 1997-98.The average ratio was (-) 0.95 percent. The trend was decreased during the study period.

The Orient Paper Ltd. showed negative net period ratio in whole years of study period of time. It was ranged between (-) 14.52 percent in 1999-2000 and (-) 2.62 percent in 2001-02 with an average of (-) 7.36 percent. The trend was negative. But the loss was decreased in consecutive years.

It can be found from the table 6.3 the net profit ratio of Grasim Ind. Ltd. ranged between 3.94 percent in 1998-99 and 11.14 percent in 2002-03. The average ratio was 7.04 percent. The ratio showed mix and increased trends through out the research period. The ratio was positive whole years of study period.

From the above interpretation and analysis a researcher revealed that the average net profit ratio highest was of 27.84 percent of Hindalco Ltd. in a span of six years, followed by Grasim Ind. Birla Power and Solution Ltd., Jay Shree Tea & Ind. Ltd., Indian Rayon Ltd. and other selected units of Birla Group of Companies.

Net Profit Ratio Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between Net profit ratio of Birla Group of Companies

Alternative Hypothesis: There is significant difference between Net profit ratios of Birla Group of Companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-6.3.1

The Comparative Position of Net Profit Ratio of Birla Group of Companies along with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	1.16	58.5	-10.81	18	-14.54	11	-6.78	26	-5.47	29	2.52	63	13.43	89	3.42	70
1998-99	-3.4	37	-15.21	10	-31.41	3	-8.11	23	-5.38	30	0.53	56	8.16	82	-2.87	39
1999-00	-5.27	31	-24.77	6	-12.86	16	-4.88	32	-1.05	49	1.79	62	-22.5	7	-4.76	33
2000-01	-7.99	24	-17.22	8	-16.54	9	-2.83	40	1.55	61	3.02	66	4.84	73	-9.55	20
2001-02	-4.18	34	-8.76	21	-13.31	15	-1.29	47.5	-0.24	52	3.3	68	3.089	67	-6.27	27
2002-03	-2.57	44	-8.38	22	-30.66	5	-1.29	47.5	3.41	69	2.83	64	7.3	78	-6.05	28
Total		**229**		**85**		**59**		**216**		**290**		**379**		**396**		**217**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
33.12	96	2.97	65	9.94	85	-0.85	50	15.59	91	5.36	74	-3.47	36	6.03	77
31.27	95	1.16	58.5	8.3	84	-0.51	51	12.72	88	12	87	-14.02	13	3.94	71
31.11	94	-3.05	38	8.11	81	-10.2	19	4.59	72	-1.86	46	-14.52	12	5.39	75
29.08	93	0	53	5.41	76	-47.6	1	-2.69	42	1.29	60	-2.72	41	7.58	80
26.74	92	-13.55	14	7.43	79	-31.4	4	-3.65	35	0.92	57	-2.62	43	8.17	83
13.69	90	0.05	54	0.21	55	-34.4	2	-2.29	45	-11.5	17	-6.8	25	11.14	86
	560		**283**		**460**		**127**		**373**		**341**		**170**		**472**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk Ri=sum of the rank

$$K = \frac{12}{96(96+1)} \left\{ \frac{(229)^2}{6} + \frac{(85)^2}{6} + \frac{(59)^2}{6} + \frac{(216)^2}{6} + \frac{(290)^2}{6} \right.$$

$$\left. \frac{(379)^2}{6} + \frac{(396)^2}{6} + \frac{(217)^2}{6} + \frac{(560)^2}{6} + \frac{(283)^2}{6} \right.$$

$$\left[\frac{(460)^2}{6} + \frac{(127)^2}{6} + \frac{(373)^2}{6} + \frac{(341)^2}{6} + \frac{(170)^2}{6} + \frac{(472)^2}{6}\right] - 3(96+1)$$

$$= 0.00128865 \quad (241110.92) - 291$$

$$= 310.71 - 291$$

$$= 19.70$$

Table No. 6.3.1 showed calculated value of H work out at 19.70, which is less than the critical value of 24.996. Hence the acceptance of the null hypothesis based on kruskal Wallis analysis of variance. The acceptance of null hypothesis would indicate that all Companies of Birla Group' s net profit ratio might be considered equal.

(II) Profitability In Relation to Capital Employed:

(1) Earning Per Share (EPS):-

Earning Per Share is widely used method of measuring profitability of the common shareholders investment it measures the profit available to the equity shareholders on per share basis. The earning per share is calculated by dividing the profit after taxes by the total number of common shares outstanding.

$$\text{Earning Per Share} = \frac{\text{Profit After Tax}}{\text{Number of Equity Share outstanding}} \times 100$$

The earning per share calculations made over years shows whether or not the firms earning power on per share basis have changed over that period. "The earning per share simply shows the profitability of the firm on a per share basis. It does not reflect how much is paid as dividend and how much is retained in business but as a profitability index. It is a valuable and widely used ratio." [12]

Thus, the profitability of common shareholders investment can be measured easily by per share Table No.-6.4 shows the Earning Per Share (EPS) of selected units of Birla Group of Companies.

An investor can take a decision on the basis of the trend of earning per share for number years. Earning Per Share has been calculated here in Rs. Per share basis as the denomination of the face value of shares various in different companies.

An analysis of the table No.-6.4 shows wide fluctuations in the behaviour of earning per share.

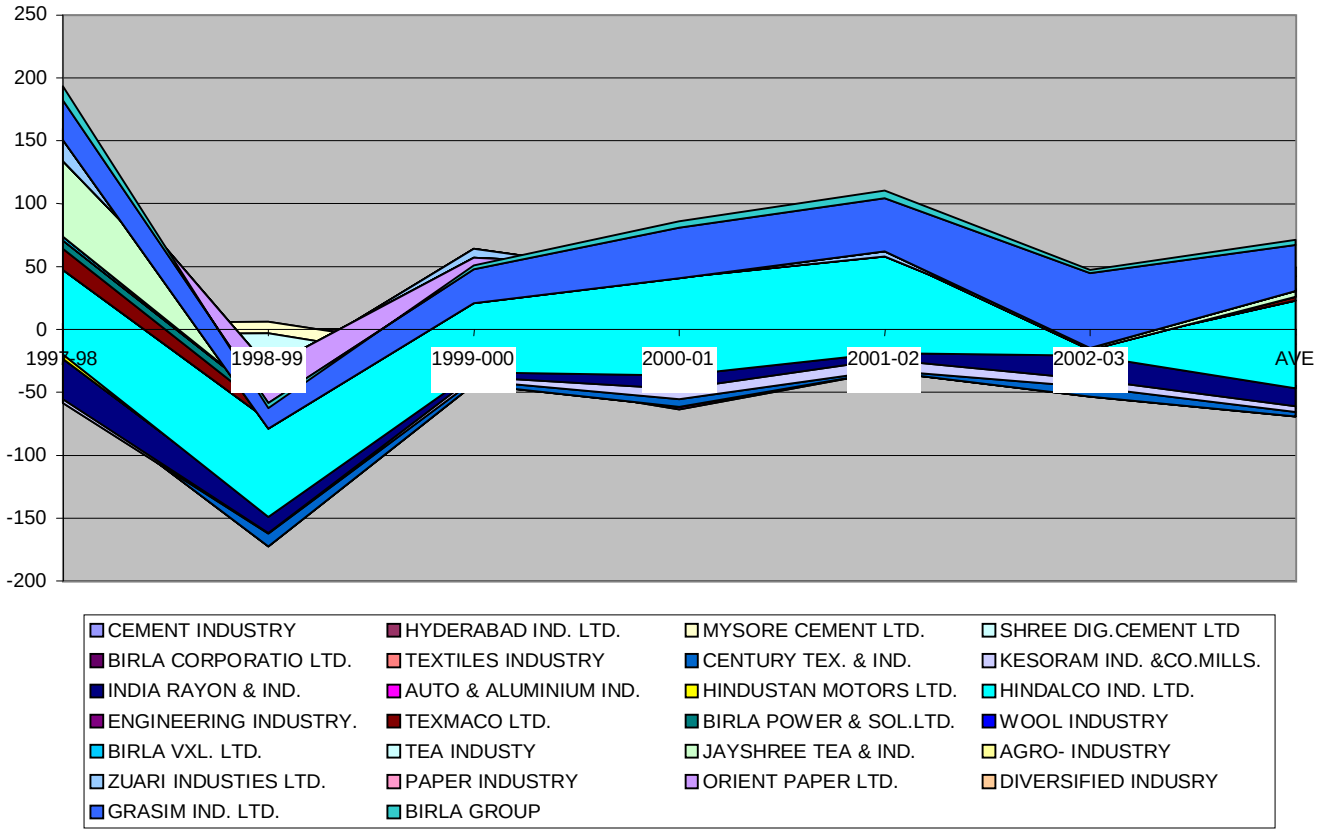
Table No.-6.4
Earning Per Share of Birla Group Companies
From 1997-98 to 2002-03 (In Rupees)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	5.12	5.93	-18.9	-9.14	-2.15	-3.92	-3.84
MYSORE CEMENT LTD.	-9.24	-8.95	-10.65	-11.038	-2.72	-3.06	-7.6
SHREE DIG.CEMENT LTD	-28.18	-151.92	-7.3	-43.27	-28.72	-45.77	-50.86
BIRLA CORPORATIO LTD.	-16.92	-17.55	-6.97	1.84	-0.098	-0.54	-6.71
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	-9.15	10	3.04	5.8	1.26	7.54	3.08
KESORAM IND. &CO.MILLS.	3.52	0.91	3.01	8.88	8.59	6.21	5.19
INDIA RAYON & IND.	31.49	15.71	9.62	11.44	7.04	20.71	16
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	3.66	-2.85	-5.78	-0.9	-2.09	-1.65	-1.6
HINDALCO IND. LTD.	66.64	76.11	82.23	91.06	92.12	6.92	69.18
ENGINEERING INDUSTRY.							
TEXMACO LTD.	16.71	8.04	2.77	5.56	-9.94	2.44	4.26
BIRLA POWER & SOL.LTD.	6.88	6.98	5.83	4.89	4.63	2.04	5.21
WOOL INDUSTRY							
BIRLA VXL. LTD.	3.16	-0.18	-3.28	-22.15	-7.87	-7.29	-6.27
TEA INDUSTY							
JAYSHREE TEA & IND.	60	22.47	10.87	-1.42	-2.01	7.45	16.23
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	26.21	5.43	-7.34	8.05	4.3	7.08	7.29
PAPER INDUSTRY							
ORIENT PAPER LTD.	-9.7	-48.77	-36.06	-8.63	-0.26	-12.76	-19.36
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	32	20	27	40	42	59	36.67
BIRLA GROUP	**11.39**	**-3.67**	**3.01**	**5.06**	**6.51**	**2.78**	**4.18**

Sources:Computed from Annual Reports & A/C's from 1997-98to 2002-03

Graph No :-6.4

Earning Per Share Ratio



The Table No.-6.4 showed earning per-share of Birla Group of Companies. E.P.S. showed decreasing trend during the study period. The E.P.S. was Rs.2.78 in 2002-03 to highest of Rs.11.39 in 1997-98. The average E.P.S. was Rs.4.18 which considered being satisfactory.

In the Hyderabad Ind. Ltd. the earning per ranged from negative Rs.18.90 in 1999-2000 to Rs.5.93 in 1998-99. The ratio showed a negative but increased trend in the last three years with an average of (-) Rs.3.84. In Mysore Cement Ltd. the earning per share ranged from minus Rs.11.038 in 2000-01 to minus Rs.2.72 in 2001-2002. The average E.P.S was Rs.7.61.

The Shree Digvijay Ltd. had shown an increasing trend through the year except in 1999-2000. In most of the year the earning per share was negative that indicated that the shareholders had to bear loss. The Birla Corporation Ltd. had shown overall increased trend ranged from minus Rs.17.55 in 1998-99 to Rs.1.89 in 2000-01 with an average of minus Rs.6.71

In Century Textiles Ltd. the earning per share varied from Rs.-0 .15 in 1997-98 to Rs. 10 in 1998-99 with an average Rs. 3.08 during the study period. The trend was fluctuated. In Kesoram Ind. Ltd. the earning per share varied from Rs. 091 in 1998-99 to Rs. 8.88 in 2000-2001. The average EPS was Rs. 5.19 and the trend was fluctuated during the period of study.

The Grasim Ind. Ltd. showed the trend of EPS, which was decreased up to 1999-2000, and then it increased in last five years. The EPS varied from Rs. 27 in 1999-2000 to Rs. 59 in 2002-03 with an average of Rs. 36.67. The Indian Rayon & Ind. had showed decreased trend. The earning per share ranged Rs. 7.04 in 2001-02 to Rs. 31.49 in 1997-98 with an average of Rs.16.

The Hindustan Motor Ltd. had shown a negetive and fluctuating trend. The earning per share ranged from negative Rs. 5.78 in 1999-2000 to Rs. 3.66 in 1997-98 with an average minus Rs. 1.60. In the Hindalco Ind. ltd. the earning per share ranged from Rs. 92.92 in 2002-03 to Rs. 9212 in 2001-02. The average EPS was Rs 78.51 and the trend increased except in 2002-03.

In Texmaco Ltd. the earning per share range between minus Rs. 9.94 in 2001-02 and Rs.3.66 in 1997-98 with an average of Rs. 4.29. The trend was decreasing for the study period. In Birla Power and Solution Ltd. the earning per share varied from Rs. 2.04 in 2002-03 to Rs. 6.98 in 1998-99 with an average of Rs. 5.20. The earning per share showed decreasing trend during the study period.

In woolen industry of Birla Group of Companies Birla VXL Ltd. has shown the earning per share fluctuated from negative Rs. 22.15 in 2000-01 to Rs. 3.16 in 1997-98. The average ratio was minus Rs.6.27 which was less than the over all average of Birla Group of companies.

The Jay Shree Tea & Ind. Ltd. shows an average of Rs. 16.23 ranged from negative Rs. 2.01 in 2001-02 to Rs. 60 in 1997-98. The earning per share trend decreased during the study period.

The Zuari Ind. Ltd. had showed overall fluctuating trend ranged from minus Rs. 7.34 in 1999-2000 Rs.26.21 in 1997-98 with an average of Rs. 7.29 during the study period.

In Orient Paper Ltd., the earning per share showed negative and fluctuated trend. The highest EPS was Rs.(-)0.26 in 2001-02 and the lowest EPS was (-) 44.77 in 1998-99 with an average of Rs. (-) 19.45.

As the whole Hindalco ltd. had highest earning per share of Rs. 78.51 on an average during the study period followed by Grasim Ind. Ltd., Jay Shree Tea & Ind. Ltd., Indian Rayon & Ind. Ltd., Birla Power & Solution Ltd. Kesoram Ind. Ltd. and other selected units.

Earning Per Share Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between earning per share of Birla Group of companies

Alternative Hypothesis: There is significant difference between earning per share of Birla Group of companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-6.4.1
The Comparative Position of Earning Per Share of Birla Group of Companies along with the application of Kruskal Wallis one-way analysis of variance test on these ratios

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	5.12	57	-9.24	17	-28.18	7	-16.92	11	-9.15	18	3.52	52	31.49	86	3.66	53
1998-99	5.93	62	-8.95	20	-151.9	1	-17.55	10	10	76	0.91	43	15.71	79	-2.85	31
1999-00	-18.9	9	-10.65	14	-7.3	24	-6.97	26	3.04	50	3.01	49	9.62	75	-5.78	27
2000-01	-9.14	19	-11.04	13	-43.27	4	1.84	45	5.8	60	8.88	74	11.44	78	-0.9	38
2001-02	-2.15	33	-2.72	32	-28.72	6	-0.098	42	1.26	44	8.59	73	7.04	67	-2.09	34
2002-03	-3.92	28	-3.06	30	-45.77	3	-0.54	39	7.54	70	6.21	63	20.71	82	-1.65	36
Total		**208**		**126**		**45**		**173**		**318**		**354**		**467**		**219**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
66.64	92	16.71	80	6.88	64	3.16	51	60	91	26.21	84	-9.7	16	32	87
76.11	93	8.04	71	6.98	66	-0.18	41	22.47	83	5.43	58	-48.77	2	20	81
82.23	94	2.77	48	5.83	61	-3.28	29	10.87	77	-7.34	23	-36.06	5	27	85
91.06	95	5.56	59	4.89	56	-22.15	8	-1.42	37	8.05	72	-8.63	21	40	88
92.12	96	-9.94	15	4.63	55	-7.87	22	-2.01	35	4.3	54	-0.26	40	42	89
6.92	65	2.44	47	2.04	46	-7.29	25	7.45	69	7.08	68	-12.76	12	59	90
	535		**320**		**348**		**176**		**392**		**359**		**96**		**520**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk and Ri=sum of the rank

$$K = \frac{12}{96(96+1)} \left[\frac{(208)^2}{6} + \frac{(126)^2}{6} + \frac{(45)^2}{6} + \frac{(173)^2}{6} + \frac{(318)^2}{6} \right.$$

$$\frac{(354)^2}{6} + \frac{(467)^2}{6} + \frac{(219)^2}{6} + \frac{(535)^2}{6} + \frac{(320)^2}{6}$$

$$\left. \frac{(348)^2}{6} + \frac{(176)^2}{6} + \frac{(392)^2}{6} + \frac{(359)^2}{6} + \frac{(96)^2}{6} + \frac{(520)^2}{6} \right] - 3(96+1)$$

= 0.00128865 (281075) – 291

= 362.21 -291

= 71.21

On the basis of above table the calculated value of H works out at 71.21, being more than the critical value of 24.996. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Rejection of the null hypothesis and the acceptance of alternative hypothesis reveal that there has been significance different between the earning per share of Birla Group of companies. It may also lead to the conclusion that the earning per share differs from plant to plant.

(2) Return on Capital Employed:-

In day to day use the term"capital employed" is used to indicate the total investment in the firm whether owners or borrowed."[13] But the capital employed in a firm may be defined in a number of ways and the two mostly widely accepted definitions are Gross Capital Employed and Net Capital Employed.

Gross Capital Employed usually comprises the total assets used in the in the business while net capital employed consists of the total assets of the business less its current liabilities

(i) Return on Gross Capital Employed:-

On the ground that the current liabilities are also a form of capital and all funds must be effectively employed. The Gross capital employed concept may be favoured by the analyses. Thus:

Gross Capital Employed = Fixed Assets + Current Assets.

It may be noted that the total of fixed of assets and current assets does not necessarily represents total assets or total liabilities of a company

(ii) Net Capital Employed: -

On the ground that further either only short-term creditors or only short-term debtors should be included in the capital employed. The net capital employed concept may be favoured.

Net capital employed = Gross capital employed–current liabilities

OR

= Fixed assets + Net working capital

(i) Return on Gross Capital Employed

As defined earlier gross capital employed is that total of fixed assets and current assets. Alternatively, it is the quantum of liabilities plus shareholders equity. The numerator, i.e.net profit before interest and taxes has been taken for computing this ratio. The different Birla Group of Companies in India charged depreciation by writing down the value method for some years. It means that the depreciation has not been included in the numerator.

Table No.-6.5 showed the return on gross capital employed. In the Birla Group of Companies under study the return on gross capital employed had been on an average 5.82 percent.

In the Hyderabad Cement Ltd. had an average return on gross capital employed 3.14 percent ranging from 0.16 percent in 2000-2001 to 7.06 percent in 1997-98.The ratio showed fluctuated trend during the span of period.

In Mysore Cement Ltd. the return on gross capital employed ranged from (-) 4.67 percent in 1999-2000 to 1.69 percent in 1997-98. The ratio showed negative and fluctuated trend.

The return on gross capital employed had been on an average (-) 4.15 percent in Shree Digvijay Cement Ltd. The return on gross capital employed ranged from negative 23.8 percent to in 1198-99 to 5.37 percent in 2001-02. The trend was highly fluctuated during the span of period.

Birla Corporation Ltd. showed average ratio 1.73 percent ranging from negative 0.93 percent in 1998-99 to 3.72 percent in 2002-03 and the ratio

showed increased trend during the research period. In cement industry the highest average ratio was 3.14 percent of Hyderabad Cement Ltd.

Table No.-6.5
The Return on Gross Capital Employed Ratio of Birla Group of Companies. From 1997-98 to 2002-03 (In percent)

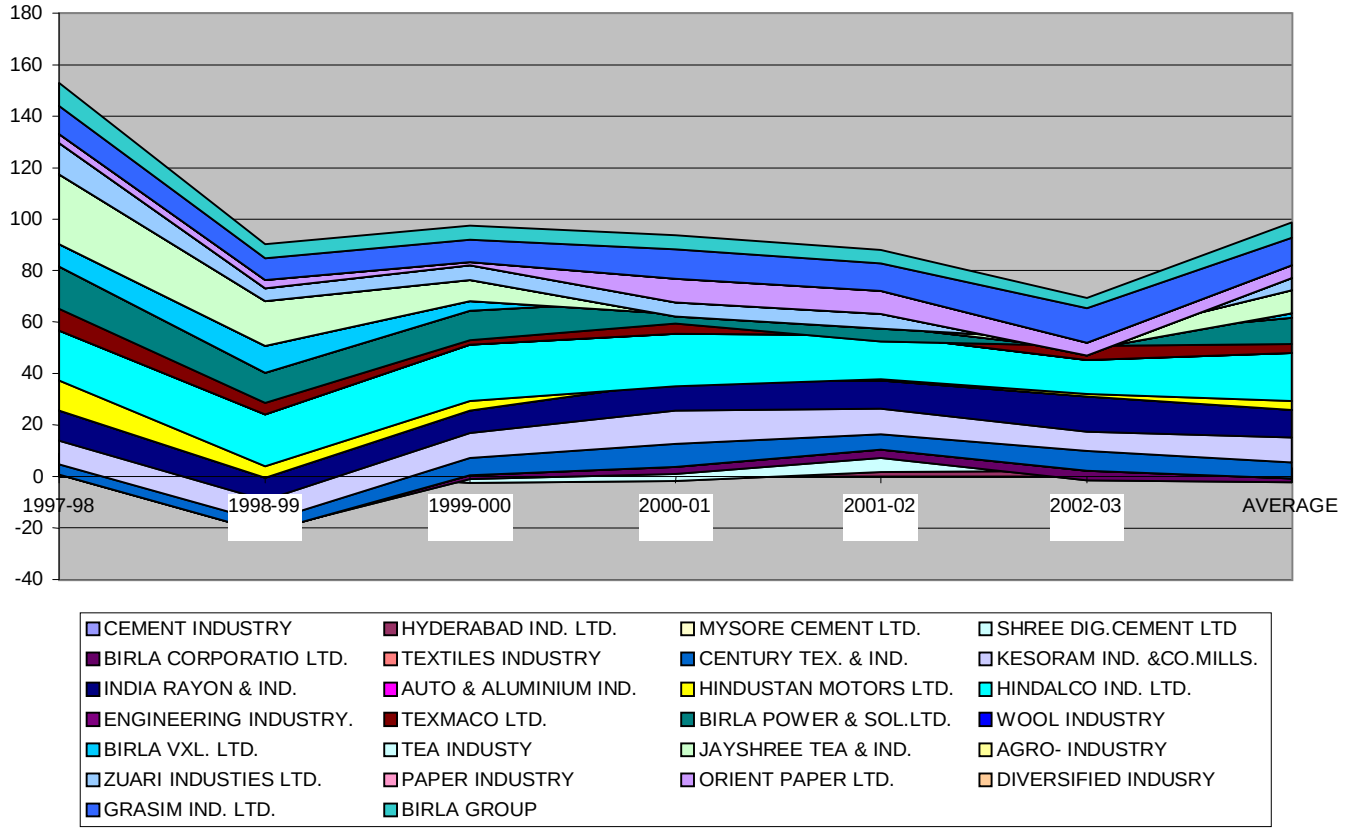
COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	7.06	3.36	2.21	0.16	2.89	3.18	**3.14**
MYSORE CEMENT LTD.	1.69	-0.83	-4.67	-2.08	-1.13	-1.13	**-1.36**
SHREE DIG.CEMENT LTD	-7.08	-23.8	1.48	2.91	5.37	-3.78	**-4.15**
BIRLA CORPORATIO LTD.	-0.92	-0.43	1.6	2.86	3.54	3.72	**1.73**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	3.91	3.9	6.71	8.78	5.85	7.83	**6.16**
KESORAM IND. &CO.MILLS.	9.25	8.78	9.47	12.84	9.84	7.62	**9.63**
INDIA RAYON & IND.	11.77	8.59	8.79	11.34	10.91	13.7	**10.85**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	11.65	4.4	3.76	-1.72	0.55	0.9	**3.26**
HINDALCO IND. LTD.	19.32	20.11	21.73	20.35	17.04	13.31	**18.64**
ENGINEERING INDUSTRY							
TEXMACO LTD.	8.69	4.45	1.7	4.07	-2.48	5.35	**3.63**
BIRLA POWER & SOL.LTD.	16.39	11.58	11.49	9.22	9.14	3.88	**10.28**
WOOL INDUSTRY							
BIRLA VXL. LTD.	8.46	10.64	3.92	-5.62	-2.93	-5.07	**1.57**
TEA INDUSTY							
JAYSHREE TEA & IND.	27.3	17.31	7.89	-0.83	-0.95	3.38	**9.02**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	12.16	5.08	6.19	5.31	5.62	-5.84	**4.75**
PAPER INDUSTRY							
ORIENT PAPER LTD.	3.44	3.2	0.83	9.41	8.66	4.78	**5.053**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	10.84	8.59	8.79	11.34	10.91	13.7	**10.7**
BIRLA GROUP	**8.99**	**5.31**	**5.74**	**5.52**	**5.18**	**4.09**	**5.81**

Sources: Annual Reports and Accounts from 1997-98 to 2002-03

The Century Textile Ltd. had an average of 6.76 percent of return on gross capital employed ranging from 3.90 percent in 1998-99 to 8.78 percent in 2000-01. It showed positive and fluctuated trend. In Kesoram Ind. Ltd. the return on gross capital employed had been on average 9.63 percent varied from 7.62 percent in 2002-03 to 12.84 percent in 2000-01.

Graph No :-6.5

Return on Gross Capital Employed Ratio



The ratio showed fluctuated trend. The trend declined in last year of study period. However the return is very good. Indian Rayon & Ind. Ltd. showed average ratio 9.15 percent ranging from 7.16 percent in 1999-2000 to 11.77 percent in 1997-98. The trend was fluctuated during the study period of time. The ratio was positive whole period of time. In textile Ind. the highest average ratio 10.70 percent of Grasim Ind. Ltd.

In Hindustan Motor Ltd. the ratio had been on an average of 3.23 percent varied from (-)1.72 percent in 2000-01 to 11.65 percent in 1997-98. The trend was decreasing during the research period. In Hindalco Ltd. the return on gross capital employed ranged between 13.31 percent in 2002-03 and 21.73 percent in 1999-2000 with an average of 18.64 percent. The trend was slightly fluctuated up to 2000-01 and then it declined in the last years. In auto industry the highest average ratio was 18.64 percent, which is highest in Birla Group of Companies.

In Texmaco Ltd. the return on gross capital employed had been on an average 3.63 percent ranging from 2.48 percent in 2001-02 to 8.69 percent 1997-98. The ratio showed fluctuated trend during the study period of time. The return on gross capital employed of Birla Power & Solution Ltd. ranged between 3.88 percent in 2002-03 and 16.39 percent in 1997-98. The ratio showed declined trend during the span of period with an average of 10.28 percent.

The return on gross capital employed of Birla V.X.L. Ltd. showed highest 10.64 percent in 1998-99 and the lowest ratio was 5.62 percent in 2000-01. The average ratio was 1.54 percent. The ratio started to decline after 1999-2000. In the last years the company had not received enough return on gross capital employed. In wool Ind. the highest ratio was 1.54 percent in Birla V.X.L Ltd.

In Zuari Ltd. the ratio was had been on an average 4.75 percent ranging from negative 5.89 percent in 2002-03 to 12.16 percent in 1997-98. The trend was slightly decreased. In the last years the ratio was negative 5.89 percent.

In Jay Shree Tea & Ind. Ltd. the return on gross capital employed varied from negetive 0.95 percent in 2001-02 to 27.3 percent in 1997-98. The ratio showed declined trends. The ratio was negative 0.38 and 0.95 in 2000-01, 2001-02 with an average of 9.09 percent.

The Orient Paper Ltd. had showed the return on gross capital employed. The ratio ranged between 083 percent in 1999-2000 and 9.41 percent in 2001-02 with an average of 5.053. The trend was highly fluctuated.

In Grasim Ind. Ltd. return on gross capital employed ratio ranged between 13.7 percent in 2002-03 to 8.59 percent 1998-99 with an average of 10.70 percent .The trend was fluctuated during study period.

On the whole the Hindalco Ltd. had the highest return on gross capital employed 18.64 percent on an average in a span of six years followed by Grasim Ind. Ltd., Birla Power & Solution Ltd., Kesoram Ind. Ltd., Indian Rayon & Ind. Ltd., Jay Shree Tea & Ind. Ltd., Century Textiles Ltd.., Orient Paper Ltd., Zuari Ltd. and other selected units of Birla Group of Companies.

Return on Gross Capital Employed Ratio of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance Test:

Null Hypothesis: There is no significant difference between return on gross capital employed ratio of Birla Group of companies

Alternative Hypothesis: There is significant difference between return on gross capital employed ratio of Birla Group of companies

Level of significance: 5 percent

Stastical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

Where n=n1+n2+n3..nk and Ri=sum of the rank

Table No.-6.5.1
The Comparative Position of Return on Gross Capital Employed Ratio of Birla Group of Companies with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	7.06	55	1.69	25	-7.08	2	-0.92	15	3.91	41	9.25	70	11.77	83	11.65	82
1998-99	3.36	33	-0.83	16	-23.8	1	-0.43	18	3.9	22	8.78	64	8.59	60	4.4	44
1999-00	2.21	27	-4.67	6	1.48	23	1.6	24	6.71	54	9.47	72	8.79	66	3.76	38
2000-01	0.16	19	-2.08	10	2.91	30	2.86	28	8.78	65	12.84	85	11.34	78.5	-1.72	11
2001-02	2.89	29	-1.13	12	5.37	50	3.54	36	5.85	52	9.84	73	10.91	76.5	0.55	20
2002-03	3.18	31	-1.13	13	-3.78	7	3.72	37	7.83	57	7.62	56	13.7	87.5	0.9	22
Total		**194**		**82**		**113**		**158**		**291**		**420**		**452**		**217**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
19.32	92	8.69	63	16.39	89	8.46	58	27.3	96	12.16	84	3.44	35	10.84	75
20.11	93	4.45	45	11.58	81	10.64	74	17.31	91	5.08	47	3.2	32	8.59	61
21.73	95	1.7	26	11.49	80	3.92	42	7.89	58	6.19	53	0.83	21	8.79	66
20.35	94	4.07	43	9.22	69	-5.62	4	-0.83	16	5.31	48	9.41	68	11.34	79
17.04	90	-2.48	9	9.14	68	-2.93	8	-0.95	14	5.62	51	8.66	62	10.91	76
13.31	86	5.35	49	3.88	39	-5.07	5	3.38	34	-5.84	3	4.78	46	13.7	88
	550		**235**		**426**		**191**		**309**		**286**		**264**		**444**

$$K = \frac{12}{96(96+1)}\left[\frac{(194)^2}{6} + \frac{(82)^2}{6} + \frac{(113)^2}{6} + \frac{(158)^2}{6} + \frac{(291)^2}{6}\right.$$

$$\left.\frac{(420)^2}{6} + \frac{(452)^2}{6} + \frac{(217)^2}{6} + \frac{(550)^2}{6} + \frac{(235)^2}{6}\right.$$

$$\left.\frac{(426)^2}{6} + \frac{(191)^2}{6} + \frac{(309)^2}{6} + \frac{(286)^2}{6} + \frac{(264)^2}{6} + \frac{(444)^2}{6}\right] - 3(96+1)$$

$$= 0.00128865 \quad (268984.375) - 29$$

$$= 346.627 - 291$$

$$= 55.629$$

Table No.-6.5.1 reveals that the calculated value of H equal to 55.629 is more than the critical value 24.996, therefore the null hypothesis based on Kruskal Wallis one-way analysis of variance test at 5 percent level of significance is rejected. The rejection of the null hypothesis and acceptance of its alternative hypothesis would mean that there is significance difference between the Return on gross capital employed of Birla Group of companies.

(ii) Return on Net Capital Employed:-

Net Capital Employed is the total of fixed assets plus current assets minus current liabilities. Alternatively, it is the quantum of permanent capital, i.g. Non-current liabilities plus shareholder' s equity. The numerator, i.g. Net profit before interest and taxes but after depreciation has been taken for computing this ratio. Thus:-

$$\text{Return on Net Capital Employed} = \frac{\text{Net Profit before Interest and Taxes}}{\text{Net Capital Employed}} \times 100$$

This ratio is the best of overall profitability and efficiency of the business firm. A company with high rate of return on capital employed will be in a position to capitilise; i.g.it can take advantage of all favourable market opportunities.

The return on net capital employed is given in the Table No.-6.6. The Return on Net Capital Employed of Birla Group of Companies registered a fluctuated trend during the study period with an average of 7.11 percent. The ratio was 11.25 percent in 1997-98, which sharply declined to 4.49 percent. The ratio rose to 7.04 percent in 1998-99 and 7.57 percent in 1999-2000. It further went up to 8.03 percent in 2001-02. In the last year it was 4.25 percent.

The table no.-6.6 manifests that the return on net capital employed in Hyderabad Cement Ltd. ranged between 0.27 percent in 2000-01 and 11.53 percent in 1997-98. It was 11.53 percent in 1997-98, which is decreased in 1997-98, and then it also decreased in 2000-01. The average ratio was 5.58.

The reducing feature of the ratio indicates a sizeable reduction in the profit but in the final years it is improved.

Table No.-6.6
Return on Net Capital Employed of Birla Group of Companies (From 1997-98 to 2002-03) (In percent)

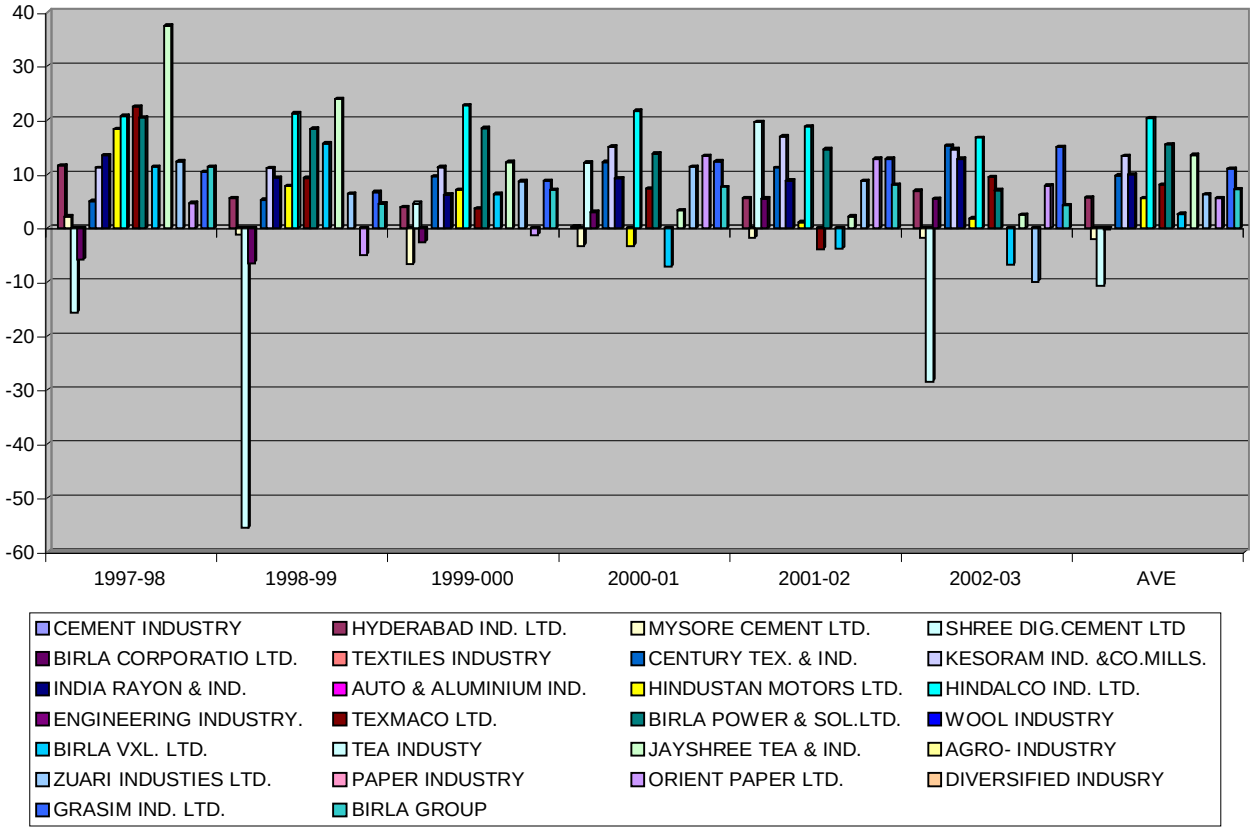
COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	11.53	5.45	3.9	0.27	5.5	6.82	**5.58**
MYSORE CEMENT LTD.	2.17	-1.12	-6.58	-3.14	-1.74	-1.76	**-2.03**
SHREE DIG.CEMENT LTD	-15.59	-55.5	4.56	12.04	19.6	-28.34	**-10.54**
BIRLA CORPORATIO LTD.	-5.78	-6.39	-2.53	2.91	5.37	5.33	**-0.18**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	4.98	5.19	9.56	12.18	11.08	15.27	**9.71**
KESORAM IND. &CO.MILLS.	11.11	11.03	11.24	15.06	17.01	14.5	**13.33**
INDIA RAYON & IND.	13.42	9.27	6.15	9.11	8.71	12.77	**9.91**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	18.24	7.75	7.04	-3.12	1.02	1.69	**5.44**
HINDALCO IND. LTD.	20.76	21.18	22.77	21.65	18.75	16.7	**20.3**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	22.51	9.24	3.58	7.23	-3.87	9.44	**8.02**
BIRLA POWER & SOL.LTD.	20.44	18.35	18.46	13.76	14.53	6.92	**15.41**
WOOL INDUSTRY							
BIRLA VXL. LTD.	11.37	15.62	6.27	-7.06	-3.77	-6.71	**2.62**
TEA INDUSTY							
JAYSHREE TEA & IND.	37.48	23.83	12.15	3.21	2.11	2.45	**13.54**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	12.29	6.29	8.62	11.36	8.63	-9.83	**6.23**
PAPER INDUSTRY							
ORIENT PAPER LTD.	4.64	-4.85	-1.19	13.37	12.7	7.82	**5.42**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	10.36	6.63	8.64	12.3	12.78	15	**10.95**
BIRLA GROUP	**11.25**	**4.49**	**7.04**	**7.57**	**8.03**	**4.25**	**7.11**

Sources: annual reports and accounts of Birla Group of companies.

In Mysore Cement Ltd. the return on capital employed ranged between (-) 6.58 percent in 1999-2000 and 2.17 percent in 1997-98 with an average of (-) 2.03. The trend was negative during the study period. The company had a loss in most of years. The return on capital employed in Shree Digvijay Ltd. ranged between (-) 5.5 percent 1998-99 and 19.6 percent in 2001-02 with an

Graph No :-6.6

Return on Net Capital Employed Ratio



average of (-) 10.53 percent. The trend was fluctuated during the study period. The ratio varied between (-) 6.39 percent in 1998-99 to 5.37percent in 2001-02 with an average of (-) 0.18 percent in the last years the trend was positive and increased.

The return net on capital employed of Century Textiles Ltd. ranged between 4.98 percent in 1997-98 to 15.27 percent in 200-01. The company had on an average 9.71 percent it shows the fluctuated trend during the study period. The company had a good return on capital employed. In Kesoram Ind. Ltd. the ratio varied from 17.01 percent in 2001-02 to 11.03 percent in 1998-99 with an average of 1.33 percent. The ratio remains constant in first three years and then after it was showing increased trend in 2000-01 and 2001-02 in the final years it was 14.5 percent. The return on net capital employed of Indian Rayon Ltd. ranged between 6.15 percent in 1999-2000 to 13.47 percent in 1997-98 with an average of 9.9 percent. The trend was positive and fluctuated during the span of the study period.

In Hindustan Motor Ltd. the average ratio had been 5.44 percent ranging from (-) 3.12 percent in 2000-01 to 18.24 percent in 1997-98. The ratio showed decreased trend after three years then it was negative in 2000-01. In the last two years it was improved. The reducing trend indicates that the profit of the company decreased. In Hindalco Ind. Ltd. the ratio was on an average 20.20 percent varying from 16.70 percent in 2002-03 to 21.65 percent in 2000-01. The average was highest in all selected units the trend was fluctuated.

In texmaco ltd. the return on net capital employed ranged between (-) 3.87 percent in 2001-02 and 22.51 percent in 1997-98 percent with an average of 8.02 percent. The trend was mix and decreased during the study period. The fluctuated trend shows that the profit also fluctuated. In Birla Power & Solution the average ratio had been 15.41 percent ranging from 6.92 percent in 2002-03 to 20.44 percent in 1997-98. The trend was decreased except in 1999-2000.

The rate of return on net capital employed if Birla V.X.L Ltd. ranged (-) 3.77 percent in 2001-02 to 15.62 percent in 1998-98 with an average of 2.62 percent. In the last year it was decreased and showed the loss on capital employed. However the trend was fluctuated during the study period.

The return on net capital employed of Jay Shree Tea & Ind. Ltd. showed decreased trend. In 1997-98 the ratio was 37.48 percent and this ratio decreased to 23.83 in 1999-2000, it was 12.51 percent in 2000-01.The ratio varied from 2.19 percent in 2001-02 to 37.48 percent in 1997-98. The trend decreased during the study period.

In Zuari Ltd. the ratio had been on an average 6.23 percent ranging from (-) 9.83 percent in 2002-03 to 12.29 Percent in 1997-98. The trend was fluctuated during the study period of time.

In Orient Paper Ltd. the ratio ranged between (-) 4.85 percent in 1998-99 to 13.27 percent in 2000-01 with an average of 5.4 percent. The trend was increased up to 2000-01and then after it decreased for the last three years.

In Grasim Ltd. the average ratio had been on an average 12.88 percent ranging from 9.79 percent in 1998-99 to 18.02 percent in 2002-03. The trend was fluctuated from 1997-98 to 1120-003. The ratio showed good return on capital employed.

On the whole Hindalco Ltd. had the highest return on net capital employed of 20.20 percent on an average in a span of six years followed by Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd., Kesoram Ltd., Grasim Ltd., Century Textiles Ltd. followed by other selected units.

Return on Net Capital Employed Ratio Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance Test:

Null Hypothesis: There is no significant difference between Return on net capital employed ratio of Birla Group of Companies

Alternative Hypothesis: There is significant difference between Return on net capital employed ratio of Birla Group of Companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

Table No.-6.6.1

The Comparative Position of Return on Net Capital Employed Ratio of Birla Group of Companies given in table along with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	11.53	64	2.17	24	-15.6	3	-5.78	9	4.98	32	11.11	60	13.42	74	18.24	84
1998-99	5.45	36	-1.12	19	-55.5	1	-6.39	8	5.19	33	11.03	58	9.27	54	7.75	46
1999-00	3.9	29	-6.58	7	4.56	30	-2.53	15	9.56	56	11.24	61	6.15	38	7.04	44
2000-01	0.27	20	-3.14	13	12.04	65	2.91	26	12.18	67	15.06	79	9.11	52	-3.12	14
2001-02	5.5	37	-1.74	17	19.6	88	5.37	35	11.08	59	17.01	83	8.71	51	1.02	21
2002-03	6.82	42	-1.76	16	-28.3	2	5.33	34	15.27	80	14.5	76	12.77	71	1.69	22
Total		**228**		**96**		**189**		**127**		**327**		**417**		**340**		**231**

HIND	R9	TAX	R10	BPS	R11	BV.X.L	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
20.76	90	22.51	93	20.44	89	11.37	63	37.48	96	12.29	68	4.64	31	10.36	57
21.18	91	9.24	53	18.35	85	15.62	81	23.83	95	6.29	40	-4.85	10	6.63	41
22.77	94	3.58	28	18.46	86	6.27	39	12.15	66	8.62	48	-1.19	18	8.64	50
21.65	92	7.23	45	13.76	75	-7.06	5	3.21	27	11.36	62	13.37	73	12.3	69
18.75	87	-3.87	11	14.53	77	-3.77	12	2.11	23	8.63	49	12.7	70	12.78	72
16.7	82	9.44	55	6.92	43	-6.71	6	2.45	25	-9.83	4	7.82	47	15	78
	536		**285**		**455**		**206**		**332**		**271**		**249**		**367**

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

$$K = \frac{12}{96(96+1)} \left[\frac{(228)^2}{6} + \frac{(96)^2}{6} + \frac{(189)^2}{6} + \frac{(127)^2}{6} + \frac{(327)^2}{6} \right.$$

$$\left. \frac{(417)^2}{6} + \frac{(340)^2}{6} + \frac{(231)^2}{6} + \frac{(536)^2}{6} + \frac{(285)^2}{6} \right.$$

$$\left. \frac{(455)^2}{6} + \frac{(206)^2}{6} + \frac{(332)^2}{6} + \frac{(271)^2}{6} + \frac{(249)^2}{6} + \frac{(367)}{6}^2 \right] - 3(96+1)$$

$$= 0.00128865 \quad (260194.33) - 291$$

$$= 335.30 - 291$$

$$= 44.30$$

On the basis of above table the calculated value of H works out at 44.30, being more than the critical value of 24.996. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Rejection of the null hypothesis and the acceptance of alternative hypothesis reveal that there has been significance different between the return on net capital employed of Birla Group of Companies. It may also lead to the conclusion that the return on net capital employed differs from plant to plant.

(3) Return on Net Worth:-

Return on net worth is also known as return on shareholders equity. This ratio shows how the firm will have used the resources of owners. It may true that this ratio is one of the most relationship in financial analysis. This retun on owner' s equity is calculated by following formula:

$$\text{Return on Net Worth} = \frac{\text{Net Profit after Taxes and Interest}}{\text{Net Worth}} \times 100$$

Where, owner' s equity = share capital + reserve & surplus.

This ratio indicated the extent to which this objective has been fulfilled. This, ratio reflects great interest to present as well as prospective shareholders and also important for management, because management has responsibility of maximizing the owners wealth the market place.

This ratio would be compared with the ratios for other similar companies as well as the industry average. Thus, it shows the relative performance and strength of the company.

According to Weston and Brigham "The usual standard of the return on owners fund is 10-15 percent."[14]

It is cleared from the table no.-6.7 the return on owner' s equity of Hyderabad Cement Ltd. ranged between (-) 28.86 percent in 2000-01 to 3.39 percent in 1997-98 with an average of (-) 13.39 percent. The trend was negative and fluctuated throughout the study period. The company failed to maintain the standard of 11-15 percent.

Table No. -6.7.
Return on Net-worth of Birla Group of Companies From 1997-98 to 2002-03 (In Rupees)

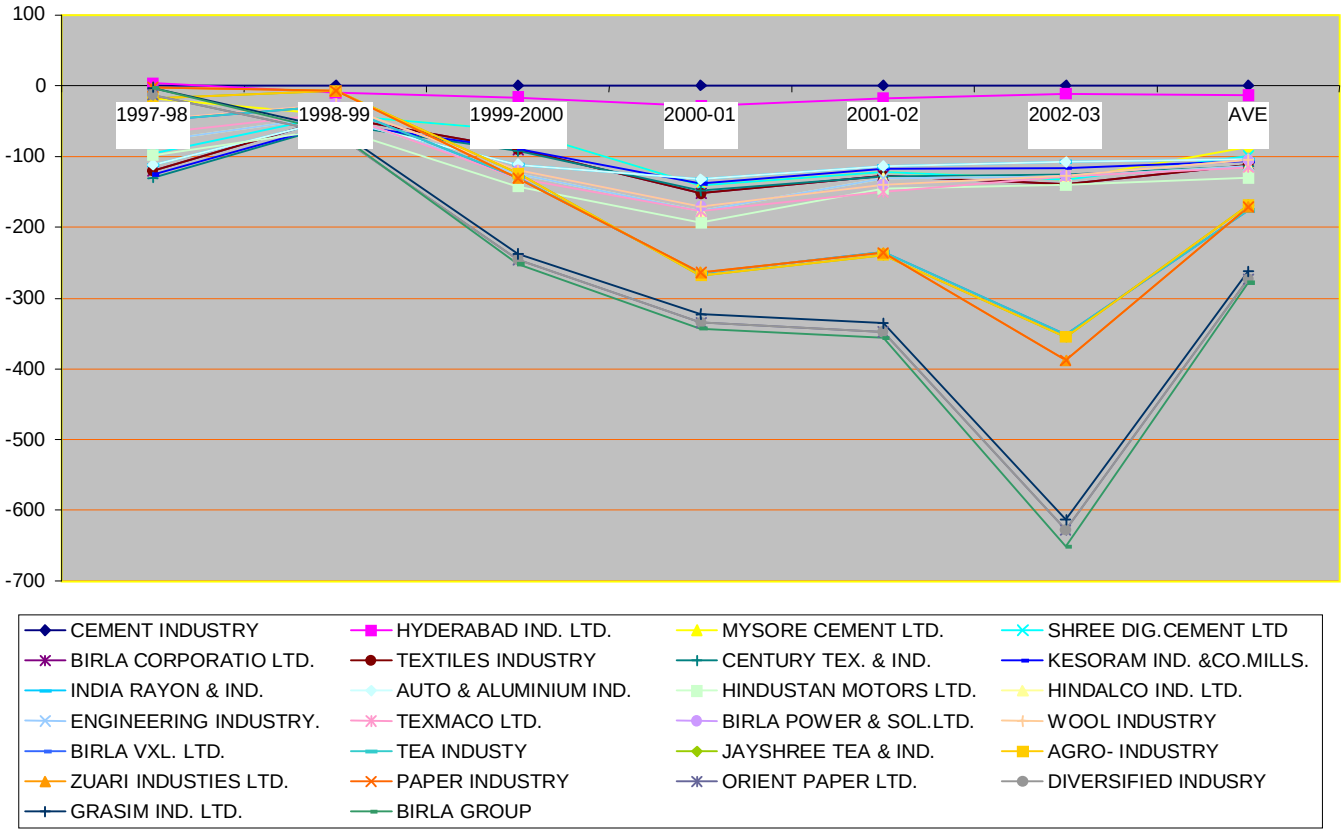
COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	3.39	-9.45	-16.21	-28.86	-17.68	-11.52	-13.39
MYSORE CEMENT LTD.	-21.72	-31.58	-47.23	-111.48	-104.3	-121.49	-72.97
SHREE DIG.CEMENT LTD	-77.07	0	0	0	0	0	-12.845
BIRLA CORPORATIO LTD.	-24.77	-3.25	-26.61	-12.07	-5.68	-5.79	-13.03
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	-10.11	-10.56	-2.51	3.93	-0.74	12.46	-1.255
KESORAM IND. &CO.MILLS.	4.7	0.96	3.27	9.95	11.04	10.1	6.67
INDIA RAYON & IND.	13.47	7.5	-22.05	6	3.94	9	2.976
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	13.39	-14.05	-30.99	-61.18	-31.57	-33.4	-26.3
HINDALCO IND. LTD.	19.41	18.43	17.92	16.19	13.92	12.65	16.42
ENGINEERING INDUSTRY.							
TEXMACO LTD.	12.02	3.21	-6.11	0	-18.77	0.09	-1.59
BIRLA POWER & SOL.LTD.	19.48	12.49	10.84	6.98	9.81	0.29	9.98
WOOL INDUSTRY							
BIRLA VXL. LTD.	-1.41	-1.06	-10.05	-94.65	-94.93	-223.73	-70.97
TEA INDUSTY							
JAYSHREE TEA & IND.	31.46	19.56	5.94	-3.04	-4.34	-3.1	7.74
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	16.05	0.29	-7.13	4.56	3.14	-34.05	-2.86
PAPER INDUSTRY							
ORIENT PAPER LTD.	-11.22	-61.29	-115.25	-71.4	-111.92	-239.37	-101.74
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	10.36	6.63	8.64	12.3	12.78	15	10.95
BIRLA GROUP	**-0.161**	**-3.87**	**-14.85**	**-20.17**	**-20.96**	**-38.3**	**-16.39**

Sources: Annual Reports and Accounts from 1997-98 to 2002-03.

In Mysore Cement Ltd. the return on net worth had been on an average (-) 72.97 percent with ranging from (-) 121.49 in 2002-03 to (-) 21.72 percent in 1997-98. It showed decreasing trend during the study period. In Digvijay Cement Ltd., the return had been on an average of minus (-) 18.36 percent ranging from minus 35.25 percent in 1998-99 to minus 5.69 percent in 2000-2001. It showed vary fluctuated trend during the study period.

Graph No :-6.7

Return on Net Worth Ratio



The Return on net worth of Birla Corporation Ltd. had been on an average (-) 12.85 percent varying from (-) 77.07 percent in 1997-98 to zero in all the years.

In Century Textile Ltd. the ratio had not showed adequate return on net worth. The range of ratio had been (-) 10.56 percent in 1998-99 to 12.46 percent in 2002-03. The trends was increasing with an average of (-) 1.26 during the study period. The Kesoram Mills Ltd. showed an average of 6.67 percent ranging from 0.96 percent in 1998-99 to 11.04 percent in 2001-02 with fluctuated trends. In Grasim Ind. Ltd., the return on net worth had been on an average 10.95 percent ranging from 6.63 percent in 1998-99 to 12.78 percent in 2001-02. It showed a progressive trend throughout the study period. The Indian Rayon & Ind. Ltd. showed an average of 2.98 percent ranging from (-) 22.05 percent in 1999-2000 to 13.47 percent in 1997-98 indicating a fluctuating trend.

The return on net worth of Hindustan Motors Ltd. ranged between (-) 62.18 percent in 2000-01 and 13.39 percent in 1997-98 with an average of (-) 26.47 percent. The trend was fluctuating during the study period. The Hindalco Ltd. showed the highest average of 16.42 percent ranging from 12.65 percent in 2002-03 to 19.41 percent in 1997-98. The trend was fluctuating. The company could take the advantages of market opportunities.

In the Texmaco ltd., the return on net -worth had been on average (-) 1.59 percent ranging from (-) 18.77 percent in 2001-02 to 12.02 percent in 1997-98. The trend was most fluctuated in most of the years. The Birla Power & Solution had 9.98 percent average rate return on net worth ranging from 0.29 percent in 2002-03 to 19.48 percent in 1997-98. It evidenced the fluctuating trend.

The Birla V.X.L. Ltd. showed on an average of (-) 70.97 percent ranging from (-) 223.73 percent in 2002-03 to (-) 1.06 percent in 1998-99 with a negative and fluctuated trend

In Jay Shree Tea & Ind. Ltd., the return on net worth had been on average 2.93 percent ranging from (-) 2.34 percent in 2001-02 to 19.58 percent in 1998-99 with a fluctuating trend.

In Zuari Ltd. the return had been of (-) 2.86 percent ranging from minus 34.05 percent in 2002-03 to 16.05 percent 1997-98. The trend was decline during the study period of time.

The Orient Paper Ltd. had an average return of (-) 107.74 percent, which is the lowest ranging from (-) 239.37 percent in 202-03 to 11.22 percent in 1997-98. It showed fluctuated trend during the study period of time.

On the whole Hindalco Ltd. and Grasim Ind. Ltd. have highest return on owner's equity of 16.62 percent and 10.95 percent on an average respectively during the period of study. Remain other companies Hyderabad Cement Ltd., Mysore Cement Ltd., Digvijay Cement Ltd., Birla Corporation Ltd., Kesoram Ltd., Grasim Ltd. Indian Rayon, Hindustan Motor Ltd., Hindalco Ltd., Birla VXL Ltd., Texmaco Ltd., Birla Power & Solution, Jay Shree Tea & Ind. Ltd., Zuari Ltd. and Orient Paper Ltd.

Return on Net Worth Ratio Of Birla Group of Companies and Kruskal Wallis One Way analysis of Variance test:

Null Hypothesis: There is no significant difference between return on net -worth ratio of Birla Group of Companies

Alternative Hypothesis: There is significant difference between return on net -worth ratio of Birla Group of Companies

Level of significance: 5 percent

Statistical test used: Krukal Wallis one-way analysis variance

Critical value: 24.996

$$H = \frac{12}{N(n+1)} \sum_{I=1}^{K} \frac{Ri1}{Ni} - 3(n+1)$$

$$K = \frac{12}{96(96+1)} \left[\frac{(199)^2}{6} + \frac{(71)^2}{6} + \frac{(263)^2}{6} + \frac{(190)^2}{6} + \frac{(299)^2}{6} \right.$$

$$\frac{(409)^2}{6} + \frac{(381)^2}{6} + \frac{(179)^2}{6} + \frac{(536)^2}{6} + \frac{(305)^2}{6}$$

$$\left.\frac{(451)^2}{6} + \frac{(144)^2}{6} + \frac{(382)^2}{6} + \frac{(318)^2}{6} + \frac{(64)^2}{6} + \frac{(467)^2}{6}\right] - 3(96+1)$$

= 0.00128865 (276025) –291
= 355.70 -291
= 64.70

Table No.-6.7.1

The Comparative Position of Return on Net-Worth Ratio of Birla Group of Companies given in table along with the application of Kruskal Wallis one-way analysis of variance test on these ratios.

YEAR	HDB	R1	MYS	R2	DIG	R3	BC	R4	CEN	R5	KES	R6	RYN	R7	HML	R8
1997-98	3.39	61	-21.7	24	-77	10	-24.77	22	-10.1	33	4.7	65	13.47	86	13.39	85
1998-99	-9.45	35	-31.6	17	0	50.5	-3.25	41	-10.6	32	0.96	57	7.5	70	-14.1	28
1999-00	-16.2	27	-47.2	14	0	50.5	-26.61	21	-2.51	44	3.27	60	-22.1	23	-31	19
2000-01	-28.9	20	-111	6	0	50.5	-12.07	29	3.93	62	9.95	74	6	67	-61.2	13
2001-02	-17.7	26	-104	7	0	50.5	-5.68	39	-0.74	47	11.04	78	3.94	63	-31.6	18
2002-03	-11.5	30	-121	3	0	50.5	-5.79	38	12.46	81	10.1	75	9	72	-33.4	16
Total		**199**		**71**		**263**		**190**		**299**		**409**		**381**		**179**

HIND	R9	TAX	R10	BPS	R11	BVXL	R12	TEA	R13	ZRY	R14	OPR	R15	GRM	R16
19.41	93	12.02	79	19	94	-1.41	45	31.46	96	16.05	89	-11.2	31	10.36	76
18.43	92	3.21	59	12	82	-1.06	46	19.56	95	0.29	55.5	-61.3	12	6.63	68
17.92	91	-6.11	37	11	77	-10.05	34	5.94	66	-7.13	36	-115	4	8.64	71
16.19	90	0	50.5	7	69	-94.65	9	-3.04	43	4.56	64	-71.4	11	12.3	80
13.92	87	-18.8	25	9.8	73	-94.93	8	-4.34	40	3.14	58	-112	5	12.78	84
12.65	83	0.09	54	0.3	55.5	-223.7	2	-3.1	42	-34.1	15	-239	1	15	88
	536		**305**		**451**		**144**		**382**		**318**		**64**		**467**

The reveals that the calculated value of H equal to 64.70, which is more than the critical value 24.996. Therefore, the null hypothesis based on Kruskal Wallis one-way analysis test at 5 percent level of significant is rejected. The rejection of null hypothesis and acceptance of its alternative hypothesis would mean that there is significant different between the Return n net- worth of Birla Group of industry.

Conclusion:

Chapter titled "analysis of financial efficiency" describes the conceptual framework of financial efficiency and profitability. Financial efficiency is the ability of a given investment to earn a return from its use. It' s vital instrument to measure not only the business performance but also overall efficiency in its concerned.

In present study seven types of measurement tools of financial efficiency were discussed I.e. Gross profit ratio, operating ratio, net profit ratio, earning per share, return on gross capital employed, return on net capital employed, return and return on net worth. Generally, Earning per share ratio uses widely and famous. The present study showed concept. Importance and measurement tools for profitability performance for measure the efficiency of business organization.

REFERENCES

1. ROGER, H. HERMANSON. Accounting principles, (Plano: taxes, business publications inc.1983), P.734.
2. BRADLEY J. F. "Administrative financial Management" Braves and noble, New York, 1964, p.104.
3. WESTON J.F.AND BRIGHAM E.F "Managerial Finance" cited in Sharma akhileshwar "profitability analysis of Drugs and pharmaceutical companies in India" A thesis submitted for the degree of PH.D, in the faculty of commerce, saurashtra university Rajkot 1992,p.1
4. CHYAL B. R "Financial mgt. of state enterprise" print well publisher, Jaipur, 1986,p.172
5. R.S. KULSHRESTHA "Profitability in India' s steel industry during the decade 1960-70"A thesis submitted for the degree of PH.D depts. E.A.F.M., university of Rajasthan, Jaipur, 1973, p.83.

6. MURTHY V.S. "Management finance" Vakils Feller and Simons ltd., Bombay, 1978 p.79.
7. BLOCK AND HIRT "Foundations of financial management" Richard D Irwin inc., Homewood, Illinois, 1978,p.24
8. DAVE N. V. "Industrial sickness and some key areas of management (A study of textile Industry: Gujarat) A thesis of PH.D. In faculty of commerce, saurashtra university, Rajkot, 1984, p. 260-261
9. PHILIP E.FESS AND CARL S. WARREN "Financial accounting" Southwestern publishing co, cicinnati, 1982, P.No.159.
10. PANDEY I.M. "Concept of earning power" accounting Journal, vol. IV, April, 1998
11. KHAN, M.Y. AND JAIN P.K., "Financial management", (New Delhi: tata McGraw hill publishing co. ltd. 1982), p.139.
12. PANDAY I.M. "Financial management" Vikas Publishing House Pvt.Ltd., New Delhi, 1994, No.123.
13. GUPTA R.L.& M.RADHASWAMI, Financial statement analysis (Delhi: Sultan chand&sons.1980), p.40
14. WESTON AND BRIGHAM "Managerial finance'' Holt, Rinehart, Winston, New York, 1969,p. 28

CHAPTER – 7
ANALYSIS OF ACTIVITY

Concept of Activity :

A sale of product is the primary object of any business enterprise. It is pivotal around which all activities of business are clusters. The increase or decrease of Business profit depends on the magnitude of sale because it is the key figure in the business enterprise. Income from net sales is the lifeblood of every commercial and industrial business. Sales support life of business, more sales, more profit and less sales less profit or even there may be loss. Thus resale, are to a business enterprise what oxygen is to the human being, a very material increase in the volume of the quantity of inhaled oxygen has upon the human organism.[1] The quantity, quality and regularity of flow of sales revenue govern the physical appearance and the internal conditions of the business organism. [2] In fact with the higher volume of sales the business operates with greater profits and effectiveness and operations are speeded up.

It is apparent, therefore, that the significance of any business activity can be measured in terms of its contribution towards sales. Activity radios are turnover ratios where the significance of financial figures is measured in terms of sales of business enterprise the overall profitability of any business largely depends on two factories (1) The rate of return on capital employed and (2) The turnover.

The turnover means the number of times an asset flows through a business firm's operation and in to sales. The relation between sales and profits is known as profit margin and the relation between the sales and assets is known as Assets turnover. Any change in assets turnover would affect the profitability of a business. Hence, a detailed analysis of assets turnover has been made for better study and tracing the factories responsibly for changes in the profitability.

Activity Ratio:

Activity ratios are concerned with how efficiency the assets of the firm are managed or utilized. These ratios indicate the rate at which different assets are turned over in the process of doing business. The greater rate of turnover or conversion, the more efficient the utilization or management, other things being equal, resulting in higher profitability. Some times these ratios are called efficiency ratios, or investment turnover ratios.

Thus, Turnover ratios reflect the relationship between the level of the sales and the various assets and a proper balance between assets and sales shows better management of assets. Different activity ratio have been computed for judging the effectiveness of assets utilization. These ratios are as discussed below:

(1) Total Assets Turnover Ratio
(2) Fixed Assets Turnover Ratio
(3) Current Assets Turnover ratio
(4) Capital Turnover Ratio

(1) Total Assets Turnover Ratio:

The total assets turnover relation indication of financial soundness of the business in terms of the sales revenue generated against total funds employed in the business. This ratio also indicates the efficiency with which the assets of the company have been utilized. A high ratio suggests better utilization of the total assets of vice-versa. However care should be taken in drawing conclusions. Some times the purchase of assets may be result in higher sales but may, however, case reduction in cost and thereby result in an increasing the profit. In such cases even if the ratio declines, the situation is considered favorable.

Thus, this ratio is a measure of performance of the business. This ratio is calculated by dividing the value of total assets by the value of net sales. This

ratio is also termed as capital turnover ratio. Formula for the derivation of this ratio is:

$$\text{TOTAL ASSETS TURNOVER} = \frac{\text{NET SALES}}{\text{TOTAL ASSETS}}$$

The ratio is very important because it shows that how the company is using its total assets in producing the sale. The total assets turnover of the Birla Group of Companies is given below.

TABLE NO.-7.1
TOTAL ASSETS TURNOVER RATIO Of
BIRLA GROUP OF COMPANIES (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.017	0.932	0.926	0.919	1.007	1.032	**0.972**
MYSORE CEMENT LTD.	0.81	0.662	0.516	0.789	0.866	0.962	**0.768**
SHREE DIG.CEMENT LTD	1.228	1.266	1.281	0.899	0.938	0.656	**1.045**
BIRLA CORPORATIO LTD.	1.225	1.148	1.343	1.316	1.419	1.382	**1.305**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	0.655	0.68	0.785	0.844	0.859	0.928	**0.791**
KESORAM IND. &CO.MILLS.	0.714	0.696	0.694	1.149	0.97	1.062	**0.881**
INDIA RAYON & IND.	0.563	0.579	0.588	0.797	0.768	0.81	**0.684**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.173	1.08	1.122	1.145	1.05	1.048	**1.103**
HINDALCO IND. LTD.	0.444	0.463	0.47	0.46	0.405	0.607	**0.474**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	1.341	0.985	0.692	0.776	0.494	0.604	**0.815**
BIRLA POWER & SOL.LTD.	0.811	0.733	0.751	0.759	0.799	0.71	**0.761**
WOOLL INDUSTRY							
BIRLA VXL. LTD.	0.504	0.608	0.272	0.41	0.324	0.313	**0.405**
TEA INDUSTY							
JAYSHREE TEA & IND.	1.076	0.962	0.785	0.619	0.602	0.663	**0.784**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.27	0.724	1.137	1.104	1.285	0.93	**1.075**
PAPER INDUSTRY							
ORIENT PAPER LTD.	0.938	0.847	0.791	0.915	0.86	0.832	**0.863**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.708	0.66	0.73	0.826	0.718	0.708	**0.725**
BIRLA GROUP	**0.905**	**0.814**	**0.805**	**0.857**	**0.835**	**0.827**	**0.841**

SOURCES: COMPUTED FROM ANNUAL REPORTS FROM 1997-98 TO 2002-03

The Table No.-7.1 showed the total assets turnover ratio of Birla Group of Companies. The ratio of Birla Group was fluctuating during the study period. The average ratio was 0.841 times. The ratio was varied from 0.805 times in 1999-2000 and 0.905 times in 1997-98.

Table No.-7.1 makes it evident that the total assets turnover ratio in Hyderabad Cement Ltd. showed fluctuated trend from 1997-98 to 2002-03. However in the last three years it showed increased trend. The ratio was 1.017 times in 1997-98 then it declined to 0.932 times further it declined to 0.926 times in 1999-2000 and 0.919 times in 2000-01 then after it rose to 1.007 times in 2001-02 and reached at highest level of 1.032 times in 2002-03. The average ratio was 0.972, which was greater than the combined average of Birla Group of Companies. The ratio was showing increasing trend the last three years, for the continuous increasing sales in the last three years was responsible.

In Mysore Cement Ltd. the total assets turnover ratio showed fluctuated trend after during the study period. The ratio was 0.81 times in 1997-98, and then it declined to 0.662 times in 1998-99 and 0.516 times in 1999-2000. After this year the ratio increased 0.789 times in 2000-01 it further rose to 0.866 times in 2001-02 and reached at highest level of 0.962 times in 2002-03. The average ratio was 0.768 times. The average ratio was below the average of Birla Group of Companies.

Total assets turnover ratio of Shree Digvijay Cement Ltd. was shown in the above table. The ratio showed decreasing trend throughout the study period. The ratio ranged between 1.281 timesi n 1999-2000 and 0.656 times in 2002-03 with an average of 1.045 times. The ratio was satisfactory because in most of the years the sales were more than the total assets, which showed that the management was efficiency in utilizing the total assets.

The total assets turnover ratio was depicted in the above table of Birla Corporation Ltd. The total assets turnover ration ranged between 1.225 times in 1997-98 and 1.419 times in 2001-02 with an average of 1.305 times. The

average ratio was greater than the Birla Group of Companies. The trend was increased and mixes during the span of year. The highest ratio in 1.419 showed the efficient use of total assets by the company. The company was efficient in use of total assets because the trend was increased and in most of year the ratio was more than the Birla Group of Companies.

The Table No.-7.1 showed the assets turnover ratio of Century Textiles Ltd. The average ratio had been 0.791 times. It was varied from .655 times in 1997-98 to 0.928 times in 2002-03. However the company showed the total assets turnover ratio below the average of Birla Group of Company. In this company the trend was increasing during the study period. The company was showing progress during the study period in utilizing the total assets.

The above table showed the total assets turnover ratio of Kesoram Mills Ltd. The ratio was showing the fluctuating trend during the study period with an average of 0.881 times. The ratio varied from 0.694 times in 1999-2000 to 1.149 times in 2000-01. In 1997-98 the ratio was 0.714 times then after it went downed to 0.696 times in 1998-99. It further declined to 0.694 in 1999-2000. It was highest in 1.149 times in 2000-01 then after, the ratio was dropped to 0.97 times in 2001-02 and then it reached up to 1.062 times in 2002-03. Through the analysis it can be said that in the last three years of study period the total assets turnover was more than the Birla Group of Companies showing satisfactory utilization of the total assets.

Total assets turnover ratio of Indian rayon & ind. was shown in the above table. The total assets turnover ratio varied from 0.563 times in 1997-98 to 0.810 times in 2002-03 with an average of 0.684 times. The total assets turnover ratio was showing increasing trend during the study period. The average ratio was less than the Birla Group' s average.

Above table showed the total assets turnover of Hindustan Motors Ltd. The ratio was showing the decreased trend from 1997-98 to 1999-2000 then after in increased to 1.145 times in 2000-01.After this year the ratio declined. The ratio ranged between 0.1.048 times in 2002-03 and 1.173 times in 1997-

98 with an average of 1.103 times. The average ratio was more than the Birla Group' s average.

The above table showed the total assets turnover ratio of Hindalco Ltd. The total assets turnover ratio showed increased trend from 0.444 times in 1997-98 to 0.47 times in 1999-2000. Then it declined to 0.46 times in 2000-01 during the study period. The average ratio had been 0.43 times which ranged between 0.37 times in 1998-99 and 0.61 times in 2002-03. The ratio was the highest in the last year showing the improved position of the company. The total assets turnover ratio had been on an average 0.474 times were below the average turnover ratio of Birla Group of Companies.

The total assets turnover ratio of Texmaco Ltd. was shown in the above table. The total assets turnover ratio showed the decreased trend from 1.341 times in 1997-98 to 0.692 times in 1999-2000.Then after the ratio rose to 0.776 times in 2000-01 but it was lower 0.494 times in 2001-02 and then after it went up to 0.607 times in 2002-03. The average ratio was 0.815 times which was lower than the Birla Group of Companies. During the study period, the total assets turnover ratio varied from .405 times times in 001-02 to 0.607 times in 2002-03.

The total assets turnover ratio of Birla Power & Solution was shown in the above table. Total assets turnover ratio ranged 0.71 times in 2002-03 and 0.811 times in 1997-98 with an average of 0.761 times. The average ratio was below the Birla Group of Companies with decreased and mix trend. The company was not efficient in utilizing its total assets. The company should try to enhance this ratio in through out the study period.

The Birla V.X.L Ltd. showed its total assets turnover ratio in the above Table No.-7.1. The Total assets turnover ratio showed decreased trend during the study period with an average of 0.405 times. The ratio ranged between 0.272 times in 1999-2000 and 0.608 times in 1998-99.The average ratios was less than the Birla Group of Companies. Total assets turnover ratio was not satisfactory so management should enhance the sales of the companies

The total assets turnover ratio of Jayshree Tea & Ind. Ltd. reveals the declining the trend during the study period. The ratio was 1.076 times in 1997-98, which declined to 0.962 times in 1998-99, 0.785 times in 1999-2000 then after it raised 0.41 tines in 2000-01. It was 0.324 times in 2000-02 and 0.313 times in 2002-03 with an average of 0.785 times. The ratio was more than the one in 1997-98, which indicated that the management was efficient in the beginning of the study period then the use of total assets was not up t o the mark.

The total assets turnover of Zuari Ltd. was seen in the above Table No.-7.1.The total assets turnover ratio was showing fluctuating trend during the study period. The ratio was 1.076 times in 1997-98 then it decline to 0.724 times in 1998-99. The ratio rose to 1.137 times in 1999-2000 and 1.104 times in 2000-01 and 1.285 times in 2001-02, which was more than one, showed the efficiency utilization of the total assets. The average ratio was 1.075, which was more than the combined average of Birla Group of Companies. The ratio was declined to 0.93 times in 2002-03. The ratio was satisfactory.

The above Table No.-7.1 showed total assets turnover ratio of the Orient Paper Ltd. the total assets turnover ratio varied from 0.791 times in 1999-2000 to 0.938 times in 1997-98 with an average of 0.863. The average ratio was above the Birla Group' s average. The total assets turnover ratio showed decreased trend from 1997-98 to 1999-2000, then after it rose to 0.915 times in 2000-01. It was showing decreasing trend in the last two years. The company was not utilizing its total assets properly and should try to enhance the ratio.

In Grasim Ind. Ltd. the total assets turnover ratio had been on an average of 0.725 times which fluctuated trend during the study period. The ratio varied from 0.660 times in 1998-99 and 0.826 times in 2000-01. The ratio was below the Birla Group of Companies. In most of the years the ratio was below the one. The company should try to increase this ratio by increasing the sales.

On the basis of the above information it can be said that Birla Corporation Ltd. has the highest turnover ratio followed by Hindustan Motor Ltd., Shree Digvijay Cement Ltd., Hyderabad Cement Ltd., Zuari Ltd., Kesoram Mills Ltd., and Orient Paper Ltd. All these companies have the average ratio more than the Group' s average. While other companies such as Texmaco Ltd., Jayshree Tea & Ind. Ltd., Century Textiles Ltd., Grasim Ind., Ltd., Birla Power & Solution Ltd., Hindalco Ltd., Indian Rayon & Ind. Ltd. and Birla V.X.L Ltd. had the average ratio below the Birla Group of Companies.

(2) Fixed Assets Turnover:

The net sales to fixed assets ratio measures the efficiency with which a firm is utilizing its investment in fixed assets such as land, buildings, plant and machinery, furniture etc. It also indicates the adequacy of sales in relation to the investment in fixed assets. The Net sales to fixed assets ratio is obtained by dividing sales by fixed assets (net) i.e.

$$\text{Sales to Fixed Assets Ratio} = \frac{\text{Net Sales}}{\text{Fixed Assets (Net)}}$$

A firm acquires a plant, machinery and other fixed assets for the purpose of generating sales; therefore, the efficiency of fixed assets should be judged in relation to sales. Generally a high fixed assets turnover indicates efficient utilization of fixed assets in generating sales while low ratio indicates inefficient management and utilization of fixed assets.

It also indicates that the company has an excessive investment in fixed assets in comparison of the volume sales. To obtain fixed assets turnover ratio sales are divided by the depreciated value of fixed assets, not the market value. Thus a firm, whose plant and machinery has considerably depreciated, may show a higher fixed assets turnover ratio than firm, which purchased plant and machinery recently.

The sales to fixed assets turnover ratio of Birla Group of Companies selected study, for the period of six years, have been given in the table no.-7.2.

Fixed assets turnover ratio of Birla Group of Companies was mentioned in the table no.-7.2. The ratio of Group was showing fluctuating trend during the study period with an average of 2.331. The ratio ranged 2.025 times in 2000-01 and 3.049 times in 1997-1998.

TABLE NO.-7.2
FIXED ASSETS TURNOVER RATIO OF BIRLA GROUP OF COMPANIES (In Times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	4.792	4.176	3.27	2.54	2.638	2.852	**3.378**
MYSORE CEMENT LTD.	1.657	1.335	1.026	1.453	1.604	1.873	**1.491**
SHREE DIG.CEMENT LTD	4.152	4.57	3.645	1.722	1.72	1.313	**2.853**
BIRLA CORPORATIO LTD.	2.472	2.104	2.446	2.52	2.876	2.957	**2.563**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.069	1.103	1.248	1.318	1.412	1.63	**1.297**
KESORAM IND. &CO.MILLS.	1.578	1.13	1.126	2.064	1.823	2.007	**1.621**
INDIA RAYON & IND.	0.975	1.211	1.215	1.719	1.85	2.111	**1.513**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	4.206	3.483	2.842	2.663	2.321	2.341	**2.976**
HINDALCO IND. LTD.	1.068	0.99	1.083	1.208	1.201	1.64	**1.198**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	10.66	6.641	2.975	2.417	1.538	1.992	**4.371**
BIRLA POWER & SOL.LTD.	3.492	3.345	3.304	3.576	3.968	4.143	**3.638**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.334	1.48	0.658	0.941	0.707	0.717	**0.972**
TEA INDUSTY							
JAYSHREE TEA & IND.	3.753	3.423	2.89	2.1	1.827	2.025	**2.667**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	3.637	1.622	2.17	2.891	5.557	5.256	**3.522**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.635	2.026	1.751	1.792	1.612	1.666	**1.914**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	1.305	1.117	1.253	1.47	1.377	1.426	**1.325**
BIRLA GROUP	**3.049**	**2.485**	**2.056**	**2.025**	**2.126**	**2.247**	**2.331**

SOURCES: COMPUTED FROM ANNUAL REPORTS FROM 1997-98 TO 2002-2003

Fixed assets turnover ratio of Hyderabad Cement Ltd. was showing the downward trend during the research period. The ratio was 4.792 times in 1997-98 and the nit went down to 4.176 times in 1998-99. The ratio further

went down 3.27 times in 1999-2000 and 2.54 times in 2000-01. It then rose to 2.638 times in 2001-02 and 2.852 times in 2002-03 showing improvements in the ratio. The ratio was on an average of 3.378, which was above than the Birla Group of Companies. The management had utilized fixed assets better in the first three years of the study period.

In Mysore Cement Ltd., the fixed assets turnover ratio was marking as fluctuating trend during the study period with an average of 1.149 times. The ratio was varied from 1.873 times in 002-03 and 1.026 times in 1999-2000. The ratio average ratio was below the Birla Group of Companies.

The fixed assets turnover ratio of Shree digvijay Cement Ltd. was showing decreasing trend from 1997-98 to 2002-03. The ratio was 4.152 times in 1997-98 and 4.57 times in 1998-99. It declined to 3.645 times in 1999-2000 and 1.722 times in 2000-01. The ratio further went down in the last two years 1.72 times in 2001-02 and 1.313 times in 2002-03. The average ratio was 2.563 times which was higher than the Birla Group of Companies. The fixed assets turnover ratio was good.

In Birla Corporation Ltd., the fixed assets turnover ratio was indicating fluctuating trend with an average of 2.563. The ratio ranged from 2.104 times in 1998-99 and 2.957 times in 2002-03. The average ratio was above than the Birla Group of Companies. The ratio was satisfactory.

The above table no.-7.2 showed fixed assets turnover ratio of Century Textiles Ltd. The ratio showed increased trend during the study period. The ratio increased from 1.069 times in 1997-98 to 1.103 times in 1998-99. It further increased to 1.248 timesi in 1999-2000 and 1.318 times in 2000-01. It was highest 1.412 times in 2001-02 and 1.63 times in 2002-03. The average ratio was 1.297 times which was lower than the Birla Group of Companies.

The fixed assets turnover ratio of Kesoram Mills Ltd. was fluctuated throughout the span of the research period. The ratio was 1.578 times in 1997-98 and then declined to 1.13 times in 1998-99. It was 1.126 times in 1999-2000 and rose to 2.064 times in 2000-01, which was the highest level. The

ratio declined to 1.823 times in 2001-02 and 2.007 times in 2002-03. The average was 1.621 times which was lower than the Birla Group.

Table No.-7.2 indicates that the fixed assets turnover ratio in Indian Rayon & Industries Ltd. which witnessed continuously an increasing from 0.975 times in 1997-98 to 1.215 times in 1999-2000. It was 1.719 times in 2000-01, which increased to 1.850 times in 2001-02 and 2.111 times in 2002-03.The average ratio was 1.513 times which was below than the Birla Group of Companies. The reason responsible for continuous increase was constant increase in the sales. The ratio declined in 1997-98 mainly due to addition of fixed assets.

The ratio in Hindustan Motors Ltd. reveals decreasing trend during the study period. It was 4.206 times in 1997-98, which decreased to 4.483 times in 1998-99 and dropped to 2.842 times in 1999-2000. It further declined to 2.663 times in 2000-01 and 2.231 times in 2001-02. In the last years it slightly increased to 2.341 times. The average ratio was 2.976, which was very higher than the Birla Group of Companies.

The ratio in Hindalco Ltd. witnessed fluctuating trend during the study period. The ratio ranged between 0.99 times in 1998-99 and 1.64 times in 2002-03. The ratio on an average had been 1.198 times. The average ratio was below the Birla Group of Companies. The reason responsible for the lowering the ratio was revaluation of the fixed assets during the 1998-99 and expansion programmes undertaken by the company.

The fixed assets turnover ratio in Texmaco Ltd. witnessed decreasing trend with an average of 4.371 times. The average ratio was the highest among the selected Birla Group of Companies. The ratio varied from the lowest of 1.538 times in 2001-02 to the highest of 10.66 times in 1997-98. The fixed assets turnover ratio of this company was very good and showed better utilization of the fixed assets of the company.

Birla Power & Solution Ltd. witnessed slightly fluctuating trend during the study period. The ratio was 3.492 times in 1997-98, which slightly

dropped to 3.345 times in 1998-99 and 3.304 times in 1999-2000. It rose to 3.576 times in 2000-01 and 3.968 times in 2001-02. The ratio reached at top level of 4.413 times in 2002-03.The ratios was on an average of 3.638 times which was highest than the Birla Group of Companies.

The Table.7.2 indicated that the fixed assets turnover ratio in Birla V.X.L Ltd. witnessed continuously decreasing trend during the study period except for the year 1998-99 and 2000-01. The ratio ranged from 0.658 times in 1999-2000 and 1.48 times in 1998-99 with an average of 0.972 times. The average ratio was very lower than the Birla Group of Companies. The ratio showed poor utilization of fixed assets. The company is advised to increase the sales.

The fixed assets turnover ratio of Jayshree Tea & Ind Ltd. showed decreasing trend from 3.753 times in 1997-98 to 1.827 times in 2001-02. The ratio then after increased to 2.025 times in 2002-03. The average ratio was 2.667 times which was above the Birla Group of Companies. The ratio showed better position of utilization of fixed assets of the company.

The Table No.-7.2 showed the fixed assets turnover ratio of Zuari ind. Ltd. The ratio showed decreasing trend from 3.637 times in 1997-98 to 2.17 times in 1999-2000. The ratio rose to 2.891 times in 2000-01 and reached at the highest level of 5.557 times in 2001-02 and 5.256 times in 5.256 times in 2002-03. The average ratio was 3.522 times which the third highest among the selected Birla Group of Companies. Except in 1998-99 the ratio was satisfactory.

In Orient Paper Ltd. The fixed assets turnover ratio indicates fluctuating trend during the study period. The ratio fluctuated from the highest 2.635 times in 1997-98 to the lowest 1.612 times in 2001-02 with an average of 1.914 times. The average ratio was below the Birla Group of Companies. The ratio company was able to utilize its fixed assets in the first two years because the ratio was highest during the study period.

The fixed assets turnover ratio of Grasim Industry Ltd. was seen in the above Table No.-7.2. The ratio showed fluctuating trend during the study period. The ratio was 1.305 times in 1997-98 and 1.117 times in 1998-99. It thereafter rose to 1.253 times in 1999-2000 and 1.470 times in 2000-01. The ratio declined to 1.377 times in 2001-02 and it rose in the last years of the study period. The average ratio was 1.325 times which was higher than the birla Group of Companies.

On the basis of above information it can be said that the Texmaco Ltd. had the highest fixed assets turnover ratio of 4.371 followed by Birla Power & Solution Ltd., Zuari Agro Ltd., Hindustan Motor Ltd., Digvijay Cement Ltd., and Birla Corporation Ltd., The above mentioned Companies had the highest average ratio the Birla Group of Companies.

The following Companies had the lower fixed assets ratio than the Birla Group's average such as Orient Paper Ltd., Kesoram Mills Ltd., Mysore Cement Ltd. Hindalco Ltd., Grasim Ltd., Indian Rayon & Ind. Ltd., Birla V.X.L Ltd., and Century Textiles Ltd. These Companies should try to utilize the fixed assets with full capacity.

(3) Current Assets Turnover Ratio:

The ratio is indicative of the over-all marking efficiency of the organization. The ratio also shows the unnecessary locking up of capital in inventories and funds tied up in unrealized sundry debts. Further, this ratio also suggests whether the sales are adequate in comparison to current assets or whether the current assets are too high in comparison to the sales. Thus, the ratio is an index of 'efficiency' or 'profitability' of a business firm. The current asset of a business firm includes inventories, sundry debtors, bills receivble, cash and bankblance, short-term loans and advances and other current asset.

$$\text{Current assets turnover ratio} = \frac{\text{Sales}}{\text{Current assets}}$$

The higher ratio of current assets reveals the better and efficiency management and utilization of current assets and vice-versa.

TABLE NO.-7.3
CURRENT ASSETS TURNOVER RATIO OF BIRLA GROUP OF COMPANIES (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.529	1.574	1.693	1.712	1.997	2.122	**1.771**
MYSORE CEMENT LTD.	2.745	2.429	1.916	2.939	3.218	4.013	**2.877**
SHREE DIG.CEMENT LTD	1.975	2.325	2.683	2.104	2.885	2.389	**2.393**
BIRLA CORPORATIO LTD.	2.955	2.998	3.522	3.194	3.413	3.329	**3.235**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.995	2.062	2.461	2.65	2.752	3.053	**2.496**
KESORAM IND. &CO.MILLS.	2.404	2.442	2.653	3.1	2.253	2.529	**2.563**
INDIA RAYON & IND.	1.902	1.782	1.782	2.321	2.226	2.474	**2.081**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	2.1	1.987	1.979	2.073	2.007	2.024	**2.028**
HINDALCO IND. LTD.	1.578	1.511	1.384	1.629	1.7	2.388	**1.698**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	1.726	1.358	1.154	1.616	0.856	0.933	**1.274**
BIRLA POWER & SOL.LTD.	1.047	0.936	0.961	0.923	0.962	0.835	**0.944**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.304	1.626	0.732	1.113	0.92	1.017	**1.119**
TEA INDUSTY							
JAYSHREE TEA & IND.	1.993	1.822	1.539	1.348	1.467	1.577	**1.624**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	2.842	2.1	3.013	2.288	2.628	2.131	**2.5**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.016	2.061	2.053	2.409	2.503	2.642	**2.281**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	2.28	2.279	2.434	2.558	2.865	3.09	**2.584**
BIRLA GROUP	**2.024**	**1.956**	**1.997**	**2.12**	**2.166**	**2.284**	**2.091**

SOURCES: COMPUTED FROM ANNUAL REPORTS FROM 1997-98 TO 2002-2003

The Table No.-7.3 reveals the Current assets turnover ratio in Birla Group of Companies. Current assets turnover ratio of Birla Group of Companies showed increased trend after first years of the study period. The ratio was 2.024 times in 1997-98 and then it declined to 1.956 times in 1998-99. The ratio after these years went up to 1.997 times in 1999-2000. The ratio further reached at 2.12 times in 2000-01 and 2.166 times in 2001-02. It also showed increased trend in the last years of the study period. The ratio showed

constant increased trend after first years of the study period due to increased in sales.

Table No.-7.3 makes it evident that the ratio of current assets turnover in Hyderabad Cement Ltd. registered an increasing trend throughout the study period. The ratio was 1.529 times in 1997-98 and increased to 1.574-times in 1998-99. It also rose to 1.693 1999-2000 times in the ratio was more than two showed better utilization of the current assets. The ratio was 1.712 times in 2000-01, 1.997 times in 2001-02 and 2.122 times in 2002-03. The ratio was satisfactory because in most of the years the ratio was more than one. The average ratio was 1.771 times.

The ratio of current assets turnover in Mysore Cement Ltd. ranged between 1.916 times in 1999-2000 and 4.013 times in 2002-03 indicating fluctuating trend. It was 2.745 times in 1997-98, which decreased to 2.429 times in 1998-99. It was also declined and reached at the bottom level of 1.916 times in 1999-2000 that further increased at a rocketing speed in 2000-01. The ratio went up to 3.218 times in 2001-02 and 4.013 times in 2002-03. The ratio on an average had been 2.877 times which more than the Birla Group of companies was. The ratio showed the utilization of the current assets in generation of the sales was satisfactory throughout the study period.

Current assets turnover ratio of Shree Digvijay Cement Ltd. was seen in the above table which showed fluctuated trend during the study period. The ratio ranged between 1.975 times in 1997-98 to 2.885 times in 2001-02 with an average of 2.393 times. Average ratio was more than the Birla Group of Companies. The ratio was satisfactory during the study period.

In the above table current assets turnover ratio of the Birla Corporation Ltd. showed fluctuated trend. The ratio was 2.955 times in 1997-98 and 2.998 times in 1998-99. The ratio increased to 3.522 times in 1999-2000 and it lightly declined to 3.194 times in 2000-01. The ratio in the last two years had been 3.413 times 2001-02 and 3.329 times in 2002-03. The average ratio was 3.235 times which more than the Birla Group of Companies was. Current

Assets Turnover ratio was very satisfactory because the management had utilized the current assets in generation of enough sales.

The above table showed Current assets turnover ratio of Century Textiles & Ind. Ltd. The ratio mentioned increased trend during the study period. The ratio increased from 1.995 times in 1997-98 to 2.062 times in 1998-99, 2.462 times in 1999-2000, 2.65 times in 2000-01 and 2.752 times in 2001-02 and reached at the top level of 3.053 times. The ratio ranged between 1.995 times to 3.053 times with an average of 2.496 times. The average ratio was more than the Birla Group of Companies. The ratio was performed well during the study period due to increased in sales.

The Current assets turnover ratio of Kesoram Mills Ltd. showed fluctuated trend during the study period with an average of 2.563 times. The average ratio was good. The ratio ranged between 2.404 times in 1997-98 to 3.10 times in 2000-01. In most of the years the ratio was more than the two, which was considered good.

Current assets turnover ratio of Indian Rayon & Ind. showed in the above table that the trend was increased. The ratio was 1.902 times in 1997-98 and then after it declined to 1.785 times in 1998-99. The ratio slightly changed to 1.782 times in1999-2000 and in 2000-01 the ratio was jumped high at the level of 2.321 times but it declined to 2.226 times in 2001-02 and then rose to 2.474 times in 2002-03.The average ratio had been 2.081 times considered to be satisfied.

Current assets turnover ratio of Hindustan Motor Ltd. was showing fluctuated trend during the study period with an average of 2.028 times. The ratio varied from 1.979 times in 1999-2000 and 2.10 times in 1997-98. The ratio was satisfactory.

Current assets turnover ratio of Hindalco Ltd. was toward increased through out the study period. The ratio was 1.578 times in 1997-98 and 1.511 times in 1998-99. The ratio was then after declined to1.384 times in 1999-2000 and rose to 1.629 times in 2000-01. The ratio was 1.70 times in 2001-02

and reached at the top level of 2.388 with an average of 1.698 times which was lower than Birla Group of Companies. The company is advised to increase to sales.

Current assets turnover ratio of Texmaco Ltd. was seen in the above table. The ratio marked invariable trend during the study period. The ratio varied from 0.856 times in 2001-02 and 1.726 times in 1997-98. The ratio in the last years was not satisfactory because it was up to the mark. Reasons responsible for that was increased in current assets in the last two years.

Current assets turnover ratio of Birla Power & Solution Ltd. was showing ix and downward trend during the study period. The ratio ranged from the lowest of 0.835 times in 2002-03 to the highest of 1.047 times in 1997-98 with an average of 0.944 times which was very lower than the combined Group average. The ratio was not satisfactory. The company is advised to increase the sales.

Current assets turnover ratio of Birla V.X.L Ltd. had been on an average of 1.119 with showing fluctuated trend through out research period. The ratio varied from 0.732 times in 1999-2000 and 1.626 times. The ratio was not satisfactory in 1999-2000 and 2001-2002.

Current assets turnover ratio of Jayshree Tea & Ind. Ltd. was 1.993 times in 1997-98 and declined to 1.822 times in 1998-99. It was further gone down to 1.539 times in 1999-2000 and 1.348 times in 2000-01. In the last two years of the study period the ratio was 1.467 times in 2001-02 and 1.577 times in 2002-03. The ratio was comparatively not good so company is advised to increase the sales.

Current assets turnover of Zuari Ind. Ltd. was manifested in the above table no.-7.3, which was fluctuated during the study period. The ratio ranged from 2.131 times in 2002-03 and 3.013 times in 1999-2000 with an average of 2.50 times. The average ratio was more than the Birlas Group of Companies. The ratio was very good.

Current assets turnover of Orient Paper Ltd. was shown in the above table. The ratio was showing increasing trend from 1997-98 to 2002-03. The ratio was 2.016 times in 1997-98 then it increased and reached to 2.053 times in 1999-2000. The ratio further reached at 2.409 times in 2000-01 and 2.503 times in 2001-02. The ratio was 2.642 times in 2002-03 with an average of 2.281 times. The ratio was satisfactory.

Current assets turnover ratio of Grasim & Ind. Ltd. had been on an average of 2.584 times. The ratio ranged from 2.279 times in 1998-99 and 3.09 times in 2002-03. The ratio indicated increased trend except in 1997-98. The ratio was more than two in most of the years, which showed that the ratio was satisfactory.

On the basis of above analysis it can be said that the utilization of current assets on the basis of average ratio was better in Birla Corporation Ltd., followed by Mysore Cement Ltd., Grasim & Ind. Ltd., Shree Digvijay Cement Ltd., Century Textiles Ltd., Kesoram Mills Ltd., Indian Rayon & Ind. Ltd., Hindustan Motor Ltd., Zuari Ind. Ltd. and Orient Paper Ltd. Moreover all these companies had on an average ratio had been more than the Birla Group of Companies.

While other companies had the on average ratio was below the combined Group average i.e. Hyderabad Cement Ltd., Hindalco Ind. Ltd., Texmaco Ltd., Birla V.X.L Ltd., Jayshree Tea & Ind. Ltd., and Birla Power & Solution Ltd.

(4) Capital Turnover Ratio:

This ratio explains the relationship between net sales to capital employed. This ratio refers over all profitability of a firm and also refers efficiency of management. This ratio can be worked out as below:

$$\text{CAPITAL TURNOVER RATIO} = \frac{\text{NET SALES}}{\text{CAPITAL EMPLOYED}}$$

Thus capital turnover ratio, however defined, measures the efficiency of a firm in managing and utilizing its capital, the higher turnover ratio. The more efficient the management and utilization of available capital while low turnover ratios indicative of under utilization of available capital. The capital turnover ratio of Birla Group of company is given below.

TABLE NO.-7.4
CAPITAL TURNOVER RATIO OF BIRLA GROUP OF COMPANIES (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.867	1.565	1.588	1.622	1.878	2.138	**1.776**
MYSORE CEMENT LTD.	1.043	0.887	0.727	1.189	1.299	1.499	**1.107**
SHREE DIG.CEMENT LTD	2.526	3.031	3.755	3.225	3.738	3.295	**3.262**
BIRLA CORPORATIO LTD.	1.772	1.679	2.149	2.161	2.255	2.233	**2.042**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	0.825	0.872	1.052	1.172	1.348	1.728	**1.166**
KESORAM IND. &CO.MILLS.	0.895	0.843	0.829	1.46	1.455	1.904	**1.231**
INDIA RAYON & IND.	0.623	0.623	0.642	0.876	0.909	1.004	**0.779**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.837	1.952	2.097	2.074	1.94	1.962	**1.977**
HINDALCO IND. LTD.	0.477	0.487	0.493	0.482	0.446	0.736	**0.52**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	3.667	2.309	1.436	1.495	0.854	1.04	**1.8**
BIRLA POWER & SOL.LTD.	1.096	1.062	1.137	1.134	1.279	1.312	**1.17**
WOOL INDUSTRY							
BIRLA VXL. LTD.	0.69	0.887	0.393	0.518	0.387	0.396	**0.545**
TEA INDUSTY							
JAYSHREE TEA & IND.	1.398	1.16	0.983	0.806	0.773	0.883	**1**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.436	0.913	1.589	1.75	2.155	1.626	**1.578**
PAPER INDUSTRY							
ORIENT PAPER LTD.	1.371	1.243	1.154	1.308	1.283	1.328	**1.281**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.776	0.746	0.845	0.978	0.824	0.815	**0.831**
BIRLA GROUP	**1.394**	**1.266**	**1.304**	**1.391**	**1.426**	**1.494**	**1.379**

SOURCES: COMPUTED FROM ANNUAL REPORTS FROM 1997-98 TO2002-2003

The above table showed the capital turnover ratio of Birla Group of Companies. The capital turnover ratio showed increased trend during the study period. The capital turnover ratio ranged between 1.226 times in 1998-99 and 1.494 times in 2002-03 with an average of 1.379 times. The Birla

Group of company was utilizing its capital employed efficiently in the business.

The above table showed capital turnover ratio of Hyderabad Cement Ltd. The capital turnover ratio varied from 1.565 times in 1998-99 to 2.138 times in 2002-03. The average capital turnover ratio was 1.776, which was more than the Birla Group of Companies. The capital turnover ratio in comparison to Birla Group of Companies was very good. The capital turnover ratio showed increased trend except in 1997-98 during the study period. In the last year of study period the capital turnover ratio was highest which meant the company was utilizing the capital efficiently.

The capital turnover ratio of Mysore Cement Ltd. was shown in the above table. The capital turnover ratio showed decreased trend from 1.043 times in 1997-98 to 0.727 times in 1999-2000. Then after the ratio was increased to 1.189 times in 2000-01 and showing the increased trend up to the last years of study period. The capital turnover ratio had been on an average of 1.107, which was less than the Birla Group of Companies. The Management should try to increase the capital turnover ratio.

It can be seen from the above table that the capital turnover ratio Shree Digvijay Cement Ltd. was showing mix and increased trend. The ratio ranged between 2.526 times in 1997-98 and 3.755 times in 1999-2000 with an average of 3.262 times. The average ratio was higher than the Birla Group of Companies. The capital turnover ratio was very good and highest among all selected units. The management was efficient to use its capital in business.

The Birla Corporation Ltd. showed its capital turnover ratio in the above table. The capital turnover ratio was showing the increased trend from 1.772 times in 1997-98 to2.255 times in 2001-02. Then after the capital turnover ratio was decreased to 2.233 times in 2002-03. The average capital turnover ratio was 2.042 times, which was more than the combined average of Birla Group of Companies. The capital turnover ratio was satisfactory in Birla Corporation Ltd.

The capital turnover ratio of Century Textiles Ltd. was depicted in above table. The capital turnover ratio of Century Textiles Ltd. showed increased trend through out the research period. The capital turnover ratio ranged between 0.825 times in 1997-98 to 1.728 times in 2002-03. The average was 1.166, which was less than the Birla Group' s average. The capital turnover ratio in 1997-98 and 1998-99 were below than one times. It means that the capital turnover ratio was not good in the first two year. After the first two the company has improved its capital turnover ratio.

The Table No.-7.4 showed capital turnover ratio of Kesorm Textiles Mills. The capital turnover ratio showed the increased trend from 1997-98 to 2002-03. The ratio varied from 0.829 times in 1999-2000 to 1.904 times in 2002-03 with an average of 1.231 times. The average ratio was below from the combined average of Birla Group of Companies. In the first three years of the study period the ratio was showing poor management of capital employed. However The Company has improved its performance after the year of 1999-2000 to 2000-03.

The capital turnover ratio of Indian Rayon & Industries Ltd. was manifested from the above table. The ratio showed increased trend through out the study period. The capital turnover ratio was an average 0.779 times ranging from 0.623 times in 1997-98 to 1.004 times in 2002-03. The average capital turnover ratio was below than the combined Birla Group of Companies. The capital utilization was very poor in Indian Rayon & Industries Ltd.

The Table No.-7.4 showed capital turnover ratio of Hindustan Motors Ltd. The capital turnover ratio showed increased trend from 1.837 times in 1997-98 to 2.094 times in 1999-2000. The capital turnover ratio was declined after the 2000-01 and became 2.074 times. In the last two years of the study period the ratio was below the one time. The capital turnover ratio had been on average of 1.977 times. The capital turnover ratio was above the Birla Group of Companies. The company was very efficient in the use of capital.

The above table showed capital turnover ratio of Hindalco Ltd. The capital turnover ratio varied from 0.446 times in 2001-02 to 0.736 times in 2002-03. The average capital turnover ratio was 0.52 times which less than the Birla Group of Companies. The capital turnover ratio in comparison to Birla Group of Companies was not good. The capital turnover ratio showed mix and increased trend during the study period. The ratio was not satisfactory which meant the company was not utilizing the capital efficiently.

The Texmaco Ltd. showed its capital turnover ratio in the above table. The capital turnover ratio was showing the decreased trend from 3.667 times in 1997-98 to 0.854 times in 2001-02.The average capital turnover ratio was 1.80 times which was more than the combined average of Birla Group of Companies. The capital turnover ratio was satisfactory in Texmaco Ltd.

It can be seen from the above table that the capital turnover ratio of Birla Power & Solution Ltd. was showing the mix and increased trend. The ratio ranged between 1.096 times in 1998-99 and 1.312 times in 2002-03 with an average of 1.17 times. The average ratio was lower than the Birla Group of Companies. The capital turnover ratio was good. The management was efficient to use its capital in business. However the company should try to enhance its ratio. So it can contribute some thing more in the Birla Group.

The Table No.-7.4 reveals the capital turnover ratio of Birla V.X.L Ltd. The capital turnover ratio was showing the decreased trend. The ratio ranged between 0.387 times in 2001-02 and 0.887 times in 1998-99 with an average of 0.545 times. The average capital turnover was below the Birla Group of Company. The company was not efficient in utilizing its capital employed.

The Table No.-7.4 showed that the capital turnover ratio of Jayshree Tea & Industry Ltd. The capital turnover ratio showed decreased trend from 1997-98 to 2001-02. In the last years of the study period the ratio was slightly increased to 0.883. The capital turnover ratio ranged between 0.773 times in 2001-02 and 1.398 times in 1997-98. The average ratio had been 1.00 times.

The average capital turnover ratio was below the combined Birla Group of Companies. The capital employed had not been used properly in this unit. So company should try to utilize the capital employed efficiently.

The capital turnover ratio of Zuari Ltd. was manifested from the above table. The ratio showed fluctuated trend through out the study period. The capital turnover ratio was an average 1.578 times ranging from the lowest of 0.913 times in 1998-99 to the highest of 2.155 times in 2001-02. The average capital turnover ratio was above than the combined Birla Group of company. The capital utilization was very good in Zuari Ltd.

The capital ratio Orient Paper Ltd. can be seen in the above table. The capital turnover ratio was the highest1.371 times in 1997-98 then after it decreased to 1.243 times in 1998-99. The ratio showed decreased in the year of 1999-2000. After this year the ratio was increased to 1.308 times in 2000-01 and in the last two years it 1.283 times in 2001-02 and 1.328 times in 2002-03 showing upward trend. The capital was utilized properly in this company.

The capital turnover ratio of Grasim Industries Ltd. was seen from the Table No.-7.4. The capital turnover ratio showed fluctuated trend through out the study period. The ratio varied from 0.746 times in 1998-99 and 0.978 times in 2000-01.The average capital turnovers was very low from the combined average of Birla Group of Companies. However the overall capital employed turnover ratio was showing the poor utilization of its capital employed

On the basis of above analysis it can be said that the Shree Digvijay Cement Ltd. showed the highest turnover ratio followed by Birla Corporation Ltd., Hindustan Motors Ltd., Texmaco Ltd., Hyderabad Cement Ltd., Zuari Ltd., Kesoram Ltd., Century Textiles Ltd., Mysore Cement Ltd., Birla Power & Solution Ltd., Jay Shree Tea & Industry, Orient Paper Ltd., Indian Rayon & Industries Ltd., Birla V.X.L Ltd., Hindalco Ltd., and Grasim Industries Ltd.

CONCLUSION:

Activity analysis is concerned with measuring the efficiency in assets management. Some times, these analyses are also called analysis of assets utilization. The efficiency with which the assets are used would be reflected in the speed and rapidity with which assets are converted in to sales. The greater rate of turnover, the more efficient the utilization, other things being equal. For this reason, such ratios are called turnover ratio. Turnover is the primary mode for measuring the extent of efficient employment of assets by relating the assets to sales. Depending upon the various types of assets, there are various types of activity ratios, which are total assets turnover ratio, net fixed assets turnover ratio, current assets turnover ratio and capital turnover ratio. All these ratios are used for measuring the performance of activity of Birla Group of Companies.

REFERNCES

1. CHOWDHARY S.B. " Analysis of company financial statement" Asia publishing house, 1964,p.71
2. FOULK A. ROY, "Practical financial statement analysis," Tata McGraw hill ed.vi, p.155

CHAPTER – 8
ANALYSIS OF FINANCIAL STRUCTURE

Concept of Financial Structure:

According to John and Mayor "financial structure" of a business as consisting three elements assets, liabilities and capital[1] The financial structure provides an insight into the various types of sources tapped to finance the total assets employed in a business enterprise that part of financial which represents long-term sources is known as "capital structure." This term refers to make up of long –term funds as represented by the equity share capital, preference share capital and long-term debt. To circumscribe the real area of the term "Capital Structure." it may be necessary to distinguish it from term "assets structure," the assets structure refers to make-up of total assets as represented by fixed assets and current assets.[2]

Since the balance sheet is a detailed form of fundamental or structure equation. It sets forth the financial structure of an enterprise. It states the nature and amount of each of the various assets of the liabilities and of the property interest of the owner. Stating the nature of the assets, liabilities and capital is not difficult as their amount.

The financial structure can be made initially from the point of view of the time for which funds are needed. An enterprise needs funds for financing shot-term and long–term requirements. However, view is not consistent regarding the duration of each type of finance. The financial structure line is often arbitrary, hazy, and vague.[3] Financial structure includes, therefore, both the sources of finance, i.e., long-term and short-term.

From the angle of time there may be short-term capital. The short-term sources will be employed by an enterprise when the size of the funds is such as to generate sufficient cash flow to retire debt within short payment period of a year. They are invested in the current assets as a matter of policy as the current assets are automatically converted into cash during outline business operations.[4]

Long–term sources represent permanent or long- term capital. It is normally contended that if the period of debts is long enough to allow fro probable major changes in the nature of business and the repayment of debts is not within a period for which tentative business plan can be worked out, It should be included in the long term category. Financing of periods in excess of 7-10 years can be included in the long –term finance category. Though these periods will vary among various firms and industries, long –term finance may be for a period extending beyond five or seven years. However, if the enterprise is stables like the utility undertakings then the period should not be less than ten years if it is to be included in the category of long –term finance.[5]

Probably, Gesternberg has used the term "capital structure" and "financial structure" interchangeably. According to him financial structure also refers to make up of permanent capital of the Firm.[6]

Capital structure means the financial plan of a company in which the various sources of capital are mixed up in such a proportion that they provide a distinct set-up most suitable to the requirements of that particular company. The task of framing capital structure involves determination of the right proportion in which different securities should be blended.

Each corporate security has its own merits and demerits. It may be remarked that too much induction on any type of security in the capital structure of a company may prove unprofitable or risky subsequently, for example if the promoters decide to carry on business mainly with the help of equity capital without adequate debt capita, the company may forgo the advantage of " trading on equity " and thus may not fulfill the objectives of the maximum return to owners, on the other hand if a company with fluctuating income has a high capital leverage and it will undertake a greater risk. Such a capital structure will no doubt maximize the return to owners, but in lean years it would make the position of the company very critical, because the net income might not be enough to meet even the fixed change obligations on preference shares or debentures.

Undoubtedly, there should be a uniform capital structure, which suits the requirements of all companies. In other words, the capital structure has to be tailored in such a way so as to suit the needs of a particular company. Thus a model capital structure is possible only for such a Group of Companies, which have similar characteristics.

Assets Structure and Capital Structure:

Assets Structure:

The term "assets structure" refers to the right hand side of the balance sheet. It represented by total capital employed in the business. It covers various fixed and current assets with which the firm is carrying on its business activity. In other words, it refers to makeup the total assets represented by fixed and current assets. Assets structure has great importance in the manufacturing and basic industries like Birla Group because these industries require large investment in fixed assets, land, buildings and machinery and relatively less receivable and inventories.

Capital Structure:

The capital structure is used to represent the proportionate relationship between the various long- term-forms of financing, such as debentures, long-term debt, Preference capital and equity capital reserve and surplus. The term capital structure is frequently used to indicate the long- term sources of funds employed in a business enterprise. In other words, it can be said that it represents permanent financing of the concern. This is usually measured by subtracting current liabilities from total assets. Thus, capital structure, general reserve, preference share and long –term debts.

Financial Structure Analysis through the Ratio

The following ratios have been used to analyse financial structure of selected Birla Group of Companies.

(1) Debt- Equity Ratio:

(i) Long Term Debt-Equity Ratio:

This ratio is an indicator of the soundness of the configuration of the debt-equity mix. A proper mix of debt and equity helps in improving the rate of capital formation in the long run. Analysis of this ratio is made to see the gearing of the capital as well as to find out the permanent liability of the organization in comparison with owner' s funds.

This ratio can be calculated by dividing the long term debt by shareholder' s equity. This ratio is generally represented in terms of percentages. Long-term debt includes all borrowings not repayable before the completion of five-year period from the date of borrowings. For the purpose of calculation of this ratio, the term shareholders' equity includes share capital reserve and surplus minus miscellaneous expenses. This ratio is also known as "Net Worth" to indebtedness ratio." For the purpose of the mathematical computation, this ratio can be expressed thus: -

$$\text{DEBT-EQUITY} = \frac{\text{DEBT}}{\text{EQUITY}}$$

The proposed of this ratio is to find out the amount of capital supplied to a business enterprise by the owners and also of asset "cushion" available to creditors on liquidation. To repeat, the generally accepted norm of this ratio is 1:1. Theoretically, the higher are the interests of the proprietors as compared with that of creditors, the more solid would be the financial conditions of a business, significantly, and this ratio holds the same importance as the current ratio in the analysis of short-term financial position.

Long term debt-equity ratio of the Birla Group of Companies was given in following table no.-8.1

It is evident from the above table that on an average the Birla Group held a long-term debt equity ratio of 2.868 times. It implies that for every

rupees of long-term debt 2.868 rupees of net worth are available to meet them. In other words it is found that the long-tern debt is more than two times of net worth. It was 1.025 times in 1997-98 then after it showed increased trend up to 2001-02. In the last year of study period it was very high. The Birla group showed very high debt is used in comparison to net worth in the financial structure. It was risky for the debtors because the net worth was less than the long-term debt.

TABLE NO.-8.1
LONG TERM DEBT-EQUITY RATIO OF BIRLA GROUP OF COMPANIES. (In Times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	0.711	0.79	1.161	1.33	1.149	1.077	**1.036**
MYSORE CEMENT LTD.	1.15	1.471	2.633	11.203	6.297	14.28	**6.172**
SHREE DIG.CEMENT LTD	2.316	0	0	0	0	0	**0.386**
BIRLA CORPORATIO LTD.	1.365	1.892	1.092	0.855	1.065	0.936	**1.201**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.199	1.315	1.188	1.197	1.302	0.96	**1.194**
KESORAM IND.&CO.MILLS.	1.2	1.1	1.173	1.434	1.005	0.775	**1.115**
INDIA RAYON & IND.	0.61	0.47	0.34	0.29	0.27	0.21	**0.365**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.285	1.787	2.58	1.434	1.695	2.13	**1.819**
HINDALCO IND. LTD.	0.27	0.203	0.143	0.157	1.97	0.315	**0.509**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.052	0.31	0.303	0.474	0.835	0.961	**0.489**
BIRLA POWER & SOL.LTD.	0.594	0.256	0.176	0.081	0.107	0.113	**0.221**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.461	1.65	1.42	5.386	7.819	36.61	**9.058**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.346	0.364	0.29	0.397	0.547	0.488	**0.405**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.366	1.416	1.62	0.443	0.686	0.943	**1.079**
PAPER INDUSTRY							
ORIENT PAPER LTD.	1.757	3.674	11.695	52.274	22.584	29.183	**20.195**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.71	0.69	0.7	0.61	0.57	0.61	**0.648**
BIRLA GROUP	**1.025**	**1.087**	**1.657**	**4.848**	**2.994**	**5.599**	**2.868**

SOURCES: COMPUTED FROM THE ANNUAL REPORT OF BIRLA GROUP OF CO.' S

In Hyderabad Cement Ltd. the trend of this ratio was towards increase. On an average, the company maintained a long-term debt equity ratio 1.36.The

ratio ranged between 0.711 times in 1997-98 to 1.33 times in 2000-01. In most of the years the company has the above the standard ratio. It was good for the shareholders because they had the advantages of trade on equity. But it also risky for the creditors to take their debt and interest back.

In Mysore Cement Ltd. long-term debt equity ratio showed increased trend from 1.15 times in 1997-98 to 11.203 times in 2000-01 then after it declined to 6.297 times in 2001-02 but in the last year the ratio went up to 14.28. The average ratio was third highest among the selected Companies of Birla Group. The company had used much long–term debt in its financial structure, which gives soundness of the financial structure of the company. However, it is risky from debtors' the point of view.

The above table No.-8.1 showed the long- term debt equity ratio of Shree Digvijay Cement Ltd. The long–tern debt equity ratio showed 2.32 times in 1997-98 then after the net worth was negative and showed the long-term debt equity ratio minus. The position for the debtors was very bad.

The above table reveals the long term debt equity ratio of Birla Corporation Ltd. Long–term debt equity ratio showed fluctuating trend during the study period. The ratio was on an average times. The company maintained the standard norms for this ratio. The higher the long–term debt equity ratio the stronger the financial structure for and it is benefited to the shareholders. The ratio varied from 0.885 times in 2000-01 to 1.892 times in 1998-99. The average long-term debt equity ratio was less the combined average of Birla Group of Companies.

Table No.8.1 reveals the long term debt equity ratio of Century Textiles Ltd. The long –term debt equity ratio showed fluctuating trend during the study period with an average of 1.194. The long –term debt equity ratio ranged between the 0.96 times in 2002-03 to 1.312 times in 1998-99. The average ratio was below the combined average of Birla Group. The ratio was near the standard norm. The ratio was below the one in 2002-03. The average ratio indicates that the company had the good financial soundness.

The Kesoram Industry Ltd. showed the long –term debt equity ratio in the table no.-8.1 the debt equity ratio was showing the fluctuated trend during the study period. The ratio varied from 0.775 times in 2002-03 to 1.434 times in 2000-01 with an average of 1.115. In most of years the long–term debt equity ratio was more than the standard norm except in 2002-03. The ratio was showed good and solid financial soundness. However the long-term debt equity ratio was not favour to debtors, because it increases the financial risk for them.

The long – term debt equity ratio of Grasim Industries Ltd. was shown in the above table no.-8.1 the long-term debt equity ratio showed the decreased trend during the study period. The long– term debt equity ratio fluctuated from 0.57 times in 2001-02 to 0.71 times in 1997-98 with an average of 0.648 times. The average ratio was below the combined average of Birla Group of Companies. The long– term debt equity ratio was below the one rupee, which has not indicated the good financial structure. The shareholders have not the benefit of trade on equity. However such capital structure was less risky, The Company is advised to use more debt in capital structure to avail of financial leverage.

The table no.-8.1 showed the long – term debt equity ratio of Indian Rayon & Industries. The long-term debt equity ratio showed the decreased trend during the study period. The average ratio ranged between 0.21 times in 2002-03 to 0.61 times in 1997-98. The long - term debt equity ratio in most of the years were below the standard norms. The average ratio was below the combined average of Birla Group. The low ratio did not give sound financial structure in the business. The company is advised to enhance the ratio by using more long – term debts in the business because such ratio was not in favour to shareholders.

The long – term debt equity ratio of Hindustan Motors Ltd. was seen in the above table no.-8.1. The ratio showed increased trend from 1.285 times in 1997-98 to 2.58 times in 1999-2000. The ratio began to decline after this year

and showed increased trend such as 1.434 times in 2000-01 to 2.13 times in 2002-03. The ratio maintained the standard ratio of 1:1. The ratio, however on an average 1.819 times, was below the combined average of Birla Group of Companies. The long-term debt equity ratio makes stronger the financial structure of the company.

In Hindalco Ltd., the long – term debt equity ratio was fluctuated. The Long- term debt equity ratio varied from 0.143 times in 1999-2000 to 0.315 times in 2002-03 with an average of 0.509 times. The average ratio was below the combined average of Birla Group. The debt equity ratio was very low and could not maintain the standard norms of 1:1 times. Such ratio could not lead the financial structure optimum. The company is advised to increase the long – term debt to avail of trade on equity.

The above table no.-8.1 reveals the long–term debt equity ratio of Texmaco Ltd. The long–term debt equity ratio showed increased trend with an average of 0.489. The long – term debt equity ratio varied from 0.052 times in 1997-98 to 0.961 times in 2002-03. The average ratio was below the average ratio of Birla Group. It is also below the standard norms of 1:1. The company could not provide the good return on net worth because the long- term debt was less than the net worth. It means that the trade on equity was not there.

The long- term debt equity ratio of Birla Power & Solution Ltd. was framed in the above table no.-8.1. The long- term debt equity ratio indicated the trend towards decrease. The ratio ranged between 0.081 times in 2000-01 to 0.594 times in 1997-98 with an average of 0.221 times. The company could not maintain the standard ratio and also below the long – term debt equity ratio of Birla Group of companies. In most of the years the ratio was below the 50 %, which showed that the company has designed the capital structure by financing the net worth. The company has no benefit of financial leverage. The company is well advised to increase the ratio by financing in the long – term debt.

In Birla V.X.L. Ltd. the long - term debt equity ratio showed increased trend with an average of 9.058. The ratio ranged between 1.42 times in 1999-2000 to 36.61 times in 2002-03. The average ratio was above the combined average of Birla Group. The company has the second highest average ratio among the selected units. The financial position was very sound and solid. The shareholders have gained much from the company as return on net worth, because the company has taken the benefit of trade on equity. However such capital structure was risky from the debtor' s point of view.

In Jay Shree & Industries Ltd., long–term debt equity ratio was showing the highly fluctuated trend during the research period. The ratio ranged between 0.29 times in 2000-01 to 0.547 times in 2001-02. The long-term debt equity ratio had been on an average of 0.405, which was below the standard norms of 1:1. The company has on an average Rs.0.405 debt for one rupees of net worth. It showed that the company has financed more equity shareholder' s fund. The company is advised to use the long – term debt in the capital structure to have the benefit of financial leverage.

In the above table it can be seen that the long–term debt equity ratio of Zuari Ltd. was towards decrease. The ratio varied 0.443 times in 2000-01 to 1.62 times in 1999-2000. The long-term debt equity ratio was on an average of 1.079 times. The ratio on an average has been below the combined of the Birla Group. The long–term debt equity ratio from 1.366 times in 1997-98 to 1.62 times in 1999-2000 has been more than the standard norms of 1:1. Then the ratio declined and remained the below the standard norms. In the last three years the of study period the company has financed more net worth than the long - term debt.

The above table no.-8.1 showed long– term debt equity ratio of Orient Paper Ltd. The long- term debt equity ratio was showing increasing trend ranging from 1.757 times in 1997-98 to 52.274 times in 2000-01. The long–term debt equity on average has been 20.195 times which was the highest among all selected units. The company has maximum benefit of trade on

equity. The long– term debt equity ratio was very good as far as the shareholders point of view is concerned.

On the basis of above information it is found that the long–term debt equity ratio has the highest 20.19 times followed by Birla V.X.L LTD., Mysore Cement Ltd., Hindustan Motors Ltd., Century Textiles Ltd., Kesoram Mills Ltd and other selected units of Birla Group of Companies.

(ii) Total Debt-Equity Ratio:

The first approach excludes the current liabilities while in the second approach is considered. Here the D/E ratio is thus, the ratio of total outside liabilities to owner' s total funds. In other words, it is the ratio of the amount invested by outsiders to the invested by the owners of business. The calculation is given below.

$$\text{TOTAL DEBT-EQUITY RATIO} = \frac{\text{TOTAL DEBT}}{\text{SHAREHOLDER' S EQUITY}}$$

The different between this and the first approach is essentially in respect of the treatment of current liabilities. While the former excludes them, the latter includes them in the numerator should current liabilities be included in the amount of debt to calculate the Debt-Equity Ratio. While there is no doubt that current liabilities are short –term and the ability of a firm to meet such obligations is reflected in the liquidity ratios, Their amount fluctuates widely during a year and interest payment on them are not large, they should form part of the total outside liabilities to determine the ability of a firm to meet its long term obligations for a number of reasons. For one thing, individual items of current liabilities are certainly short-term and may fluctuate widely, but as a whole a fixed amount of them is always in use so that they are available more or less on a long-term footing. Moreover some current liabilities like bank credit, which ostensibly short- term, are renewed year after year and remain by and large permanently in the business. Also, current liabilities have like the

long-term creditors exercise as much, If not more, pressure on management. The omission of current liabilities in calculating the Debt-Equity Ratio would lead to misleading results.

How should preference share capital be treated? Should it be included in the debt or equity? The exact treatment will depend upon the purpose for which the Debt Equity Ratio is being computed. If the object is to examine the financial solvency of a firm in terms of its ability to avoid financial risk, preference capital should be included in equity capital. If, however, The D/E ratio is calculated to show the effect of the use of fixed-interest/dividend sources of fund on the earning available to the ordinary shareholders, preference capital should be included in debt.

Total Debt Equity Ratio is an important tool of financial analysis to appraise financial structure of a firm. It has important implication from the view point of the creditors, owners and the firm itself. The ratio reflects the relative contribution of creditors and owners of business in its financing. A high ratio shows a large share of financing by the creditors relatively to the owners and, therefore, a larger claim against the assets of the firm; a low ratio implies a smaller claim of creditors. The total debt equity ratio indicates the margin of safety to the creditors. The norm for total debt equity ratio was 2:1.

If the Debt-Equity Ratio is high, the owners are putting up relatively less Monday of their own. It is a danger signal for the creditors. If the project should fail financially, the creditors would lose heavily. A high debt-equity ratio has equally serious implications from the firm' s point of view also. A high proportion of debt in the capital structure would lead to inflexibility in the operations of the firm, as creditors would exercise pressure and intergere in management. Secondly, such a firm would be able to borrow only under very restrictive terms and conditions. Further, it would have to face a heavy burden of interest payments, particularly in adverse circumstances when profits decline. Finally, the firm will have to encounter serious difficulties in

raising funds in future. The following table showed the total debt–equity ratio of Birla Group of Companies.

TABLE NO.-8.2
TOTAL DEBT-EQUITY RATIO OF BIRLA GROUP OF COMPANIES. (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.252	1.356	1.969	2.176	2.003	1.919	**1.779**
MYSORE CEMENT LTD.	1.406	1.811	3.32	13.332	7.468	17.276	**7.435**
SHREE DIG.CEMENT LTD	2.773	0	0	0	0	0	**0.462**
BIRLA CORPORATIO LTD.	1.748	2.529	1.572	1.205	1.265	1.249	**1.595**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.591	1.805	1.694	1.691	2.042	1.627	**1.742**
KESORAM IND. &CO.MILLS.	1.361	1.23	1.287	1.749	1.502	1.346	**1.415**
INDIA RAYON & IND.	0.7	0.56	0.5	0.48	0.42	0.32	**0.497**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.683	2.561	3.408	1.937	2.298	2.823	**2.452**
HINDALCO IND. LTD.	0.284	0.211	0.151	0.163	0.209	0.387	**0.234**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.456	0.634	0.498	0.72	1.117	1.336	**0.794**
BIRLA POWER & SOL.LTD.	0.695	0.428	0.373	0.294	0.323	0.699	**0.468**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.983	2.563	1.936	5.386	7.819	36.61	**9.383**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.436	0.393	0.469	0.581	0.618	0.683	**0.53**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.517	1.559	1.81	0.825	1.013	1.471	**1.366**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.171	4.495	13.182	58.351	25.268	32.83	**22.716**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.95	0.92	0.87	0.71	0.69	0.73	**0.811**
BIRLA GROUP	**1.313**	**1.441**	**2.065**	**5.6**	**3.378**	**6.331**	**3.354**

SOURCES:COMPUTED FROM THE ANNUAL REPORT OF BIRLA GROUP OF CO.

The above table no.-8.2 described the total debt equity ratio of Birla Group of Companies. The ratio showed increased trend during the study period. The average ratio was 4.107 times which means that for every 4 rupees of outside liabilities, the firm has one rupees of owner' s capital therefore no margin of safety available for creditors.

The total debt equity ratio of Hyderabad Cement Ltd. was shown in the table no.-8.2. The ratio was on an average had been 1.779 times which was below the average ratio of combined Birla Group of Companies. The ratio varied from 1.252 times in 1997-98 to 2002-03 times in 2002-03 showing the increasing trend during the study period. The company has good financial structure.

The table no.-8.2 showed the total debt equity ratio of Mysore Cement Ltd. The ratio showed increased trend during the study period. The average ratio was 7.435 times which was very higher than the Birla Group of Companies. The ratio ranged between 1.406 times in 1997-98 to 17.276 times in 2002-03. The ratio was very high in 2000-01, 2001-02 and in 2002-03. In these years the firm has used the total debt more than the net worth. Such capital structure was good for the shareholders point of view but it is dangerous for creditors because it increase burden of interest on firm, may not pay the interest during the unfavorable conditions.

The total debt capital ratio of Shree Digvijay Cement Ltd. was seen in the table no.-8.2. The total debt equity ratio was 2.773 times in 1997-98 then after it was Zero because the net worth was negetive after the first years. The average ratio 0.46 times which was less than the Birla Group of Companies. The company is advised to increase the net worth for the company should increase the (EAT) earning after taxes and interest.

The table no.-8.2 showed the total debt equity ratio of Birla Corporation Ltd. The total debt equity ratio showed fluctuation trend during the study period. The average ratio was 1.595 times, which was less than the combined average of Birla Group of Companies. The ratio ranged between 1.205 times in 2001-02 to 2.529 times in 1998-99. The ratio was near to one rupees of debt. If such ratio would be more than two, it would be enough for the company. The Company should increase the total debt in the business.

The total debt equity ratio of Century Textiles Ltd. was seen in the above table. The ratio ranged between 1.591 times in 1997-98 to 2.042 times

in 2001-02 with an average of 1.742 times. The average ratio was below the average of Birla Group of Companies. The total debt equity ratio was not following the norms. However it is good for the creditors because it avoids risk for them.

In Kesoram Industries Ltd. the total debt equity ratio was showing the trend towards mix and increase. The total debt equity ratio was 1.361 times in 1997-98 then after it decreased to 1.23 times in 1999-2000. But after this year the ratio started to increase, and stable at 1.346 times in 2002-03. The average ratio was 1.415 times, which was less than the average of Birla Group of Companies. The company was not followed the standard of 2:1 so company is advised to enhance the total debt in the business.

The total debt equity ratio of Indian Rayon & Industries Ltd. reveals the increasing trend during the study period. The average ratio had been 0.497 times which was very low considered to other units of Birla Group of Companies. The ratio varied from 0.32 times in 2002-03 to 0.70 times in 1997-98. The company should increase the debt to have the advantages of trade on equity.

The total debt– equity ratio of Hindustan Motor Ltd. was showing the increased trend from 1.683 times in 1997-98 to 3.408 times in 1999-2000. Then the ratio began to decline. However in the last two years of study period the ratio was above two, which was very good. The average ratio was also 2.452 times but it was not as much as Birla Group of Companies, so company should try to increase the ratio.

In Hindalco Ltd. the total debt equity ratio was towards increase. The ratio on an average had been 0.234 times. The average ratio was very low. The low ratio could not give good financial structure to a firm. The company had no good return on net worth, so company should try to increase the total debt to have maximum return on net worth.

The above table no.-8.2 reveals the total debt equity ratio of Texmaco Industries Ltd. The total debt equity ratio showed upward trend during the

study period. The average ratio was 0.794 times. The average ratio was below the Birla Group of Companies. The ratio had not maintained the standard norm of 2:1. In the first four years. The ratio had improved in the last two years of study period. The company is advised to increase the total debt equity ratio.

The total debt equity ratio of Birla Power & Solution Ltd. showed the decreased trend from 0.695 times in 1997-98 to 0.323 times in 2001-02. The average ratio was 0.468 times, which was very low, compared to other selected units. The ratio should be more than two rupees. The company should increase the total debt to give the advantages of leverage.

The total debt equity ratio of Birla V.X.L. Ltd. showed the increasing trend during the study period of time. The average ratio was 9.383 times, which was second highest among the selected units. The debt-equity ratio varied from 1.936 times in 1999-2000 to 36.61 times in 2002-03. The company had used much debt in the last years, which was not good for the company. The high ratio was unfavorable to the creditors

The table no.-8.2 reveals the total debt equity ratio of Jay Shree Tea & Ind. Ltd. was towards increasing trend ranging from 0.393 times in 1998-99 to 0.683 times in 2002-03. The average ratio was 0.53 times, which was very lower than the Birla Group of Companies. The total debt equity ratio was very low, so company should increase the total debt in the capital structure.

The table no.-8.2 showed the total debt equity ratio of Zuari Ltd. The ratio showed increased trend from 1.517 times in 1997-98 to 1.81 times in 2000-01 during the study period. The average ratio was 1.366 times. The total debt equity ratio declined in 2000-01 after this year the ratio showed increased trend up to 2002-03. In these years the firm has used the total debt more than the net worth. Such capital structure was good for the shareholders point of view but it is dangerous for creditors because it increase burden of interest on firm, may not pay the interest during the unfavorable conditions.

The above table no.-8.2 reveals the total debt equity ratio of Orient Paper Ltd. The ratio indicated the increased trend from 2.171 times in 1997-98 to 58.351 times in 2000-01. Then the ratio was declined to 25.568 times, but it was very good in the last year of the study period. The company had used much debt in the financial structure in the business. However such capital structure was not satisfied the creditors.

The total debt equity ratio of Grasim industries Ltd. was towards increase. The average ratio was 0.811 times, which was not considered good for the company because the total debt equity ratio was near to 2:1. The ratio varied from 0.69 times in 2001-02 to 0.95 times in 1997-98.The average ratio was also below the combined Birla Group of Companies. The financial position was not considered good because the company had no advantages of leverage.

On The basis of above analysis the total debt equity was highest in Orient Paper Ltd. followed by Mysore Cement Ltd. and Birla V.X.L Ltd. The other units had the total debt equity ratio lower the Birla Group of Companies.

(2) Interest Coverage Ratio:

In the words of Brigham, "The times interest earned ratio is determined by dividing earning before interest and taxes (EBIT) by the interest charges."[7] It is one of the most conventional coverage ratio used to test the enterprise's debt serving capacity. Greater the cover better is the position of the debenture holders or loan creditors regarding possibility of timely payment of interest.

The ratio indicates the extent to which the earning may fall without causing any embarrassment to the enterprise regarding the payment of the interest charges. If the times covered falls then the risk of enterprise's failure increase. According to Wright, "It's basis as a measurement tool is that, as the times covered declines, the risk of failures increases."[8] A higher ratio is desirable, but too high ratio indicates that the enterprise is very conservative in

using debt, and it is not using credit to the best advantage of shareholders. However, too low ratio is a Danger signal that the firm is using excessive debt and does not have the ability to offer assured payment of interest to the creditors.

The interest coverage ratio of Birla Group of Companies was given below in the table no.-8.3

TABLE NO.-8.3
INTEREST COVERAGE RATIO OF BIRLA GROUP OF COMPANIES. (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.51	1.35	1.25	1.21	1.11	1.02	1.24
MYSORE CEMENT LTD.	0.16	-0.09	-0.58	-0.19	-0.18	-0.16	-0.17
SHREE DIG.CEMENT LTD	-0.78	-1.3	0.09	0.16	0.3	-0.22	-0.29
BIRLA CORPORATIO LTD.	-0.12	-0.05	0.2	0.43	0.66	0.72	0.3
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	0.52	0.52	0.89	1.21	0.97	1.78	0.98
KESORAM IND. &CO.MILLS.	1.27	1.05	1.18	1.43	1.59	1.79	1.39
INDIA RAYON & IND.	6.8	4.62	3.46	3.38	4.2	11.08	5.59
AUTO & ALUMINIUM IND							
HINDUSTAN MOTORS LTD.	1.74	0.58	0.42	-0.18	0.08	0.13	0.46
HINDALCO IND. LTD.	8.92	9.34	15.74	16.16	21.42	8.21	13.29
ENGINEERING INDUSTRY.							
TEXMACO LTD.	2.37	1.58	0.44	1.02	-0.61	1.36	1.02
BIRLA POWER SOL. LTD.	4.98	5.13	6.19	4.56	4.81	1.32	4.49
WOOL INDUSTRY							
BIRLA VXL. LTD.	0.98	0.97	0.59	-0.36	-0.37	-0.66	0.19
TEA INDUSTY							
JAYSHREE TEA & IND.	5.99	5.58	2.82	0.62	0.42	0.56	2.67
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	2.29	1.05	0.75	1.41	1.42	-1.22	0.95
PAPER INDUSTRY							
ORIENT PAPER LTD.	0.52	-0.36	-0.08	0.8	0.79	0.46	0.36
DIVERSIFIED IND.							
GRASIM IND. LTD.	2.56	2.29	2.91	3.61	4.63	5.65	3.61
BIRLA GROUP	**2.48**	**2.02**	**2.266**	**2.2**	**2.58**	**1.98**	**2.26**

SOURCES: COMPUTED FROM ANNUAL REPORTS OF BIRLA GROUP OF CO.'S .

The above table showed the interest coverage ratio of Birla Group of Companies. The interest coverage ratio showed the fluctuated trend during the study period. The average ratio was 2.15 times. The ratio was 2.39 times in 1997-98 then after it was declined in 1998-99. The ratio increased then after from 2.14 times in 1999-2000 to 2.48 times in 2001-02. The company had the twice ratio to coverage the interest also the firm had the greater ability to handle fixed charge the payment of the creditors was more assured.

The interest coverage ratio of Hyderabad Cement Ltd. was shown in the above table. The ratio ranged from 1.02 times in 2002-03 to 1.51 times in 1997-98. The average ratio was 1.24 times; it means if the earning before taxes and interest would decline to one to two times of the present level, net profit available for servicing the interest on loan would still be equivalent to the claims of the creditor. The interest coverage ratio was good in the Hyderabad Cement Ltd.

The above table no.-8.3 showed the interest coverage ratio of Mysore Cement Ltd. The interest coverage ratio of the unit was showing the decreasing trend during the study period. The average ratio was minus after the first year. The negetive ratio was not good for the creditors. Because it does not have the ability to offer assured payment of interest to the creditors. The average ratio was also negative.

In Shree Digvijay Cement Ltd. the interest coverage ratio was showing fluctuated trend during the research period. The interest coverage ratio was negetive in most of the years with an average of –0.29 times. The ratio was positive 0.09 times in 1999-2000, 0.16 times in 2000-01, 0.3 times in 2001-02. However such ratio was not enough to cover the payment of interest to the creditors. The company is advised to increase the operating profit.

The table no.-8.3 reveals that the interest coverage ratio of Birla Corporation Ltd. The interest coverage ratio of this company showed the trend towards increase. The average ratio was on an average 0.30 times. The average ratio was less than the Birla Group of Companies. The ratio ranged

from –0.12 times in 1997-98 to 0.72 times in 2002-03. The ratio showed improved trend in the last three years. The ratio was less than one, which does not have the ability to cover the interest of creditors. So company should try to increase the earning before interest and tax.

The interest coverage ratio of Century Textiles Mills Ltd. was seen in the above table. The interest coverage ratio marked a varied trend and was toward increase. On an average the company maintained the interest coverage ratio of 0.98 times. The ranged between 0.52 times in 1997-98 to 1.78 times in 2002-03. The interest coverage ratio except in 2000-01 was too low to cover the interest of creditors. The company should try to increase the ratio by increasing the EBIT.

In Kesoram Textiles Mills Ltd. the interest coverage ratio was above one with an average of 1.39 times such ratio was good. The ratio fluctuated from 1.05 times in 1998-99 to 1.79 times in 2002-03. The average ratio was below the average of Birla Group of Companies. In 1998-99 and in 1999-2000 the interest coverage ratio was very low; such ratio was risky for the creditors.

The interest coverage ratio was seen in the above table no.-8.3 of Grasim Ind. Ltd. The ratio marked varied trend and was toward increase. The interest coverage ratio on an average the company maintained at 3.61 times, which was above the average ratio of Birla Group of Companies. The interest coverage ratio ranged between 2.29 times in 1998-99 to 5.65 times in 2002-03. The Grasim industries Ltd. had maintained good interest coverage ratio, The Company had the ability to the interest of creditors.

The above table showed the interest coverage ratio of Indian Rayon & Ind. Ltd. The interest coverage ratio showed the decreased trend from 6.8 times in 1997-98 to 4.20 times in 2001-02. The ratio increased in the last year. The average ratio was of 5.59 times, which was more than the average of Birla Group of Companies. The interest coverage ratio was very good in this company because on an average a coverage of five times would indicate that a

fall in operating earning to only up to one- fifth level can be tolerated by the creditors.

The interest coverage ratio of Hindustan Motor Ltd. was seen in the above table no.-8.3, the trend of this ratio was towards decrease. The company maintained interest coverage ratio of 3.61 times during the most of the years the company had not maintained a reasonable and satisfactory level of this ratio except 1.74 times in 1997-98, because the interest coverage ratio showed very low after the first year, so the company should increase the operating earning.

The above table no.-8.3 showed the interest coverage ratio 0f Hindalco Industries Ltd. The interest coverage ratio ranged between 2.42 times in 2001-02 and 16.16 times in 2000-01. The average ratio was 13.29 times. The interest coverage ratio was very good and above the Birla Group of Companies. The interest coverage ratio was the highest among the selected Birla Group of Companies. The high ratio showed the firm' s ability to pay the interest of creditors. However the firm should not increase the debt now, because too high ratio may imply unused debt capacity.

The interest coverage ratio of Texmaco Ltd. was manifested in the above table. The interest coverage ratio was showing the decreasing trend during the research period. The company had maintained the average ratio of 1.02 varying from –0.61 times in 2001-02 to 2.37 times in 1997-98. The ratio was very low e.g. –0.61 times in 2001-02, and 0.44 times in 1999-2000. However, the company had come out in the last year. The average ratio was 52.50 percent below the average of Birla Group of Companies, so, company is advised to increase the ratio to scope with the Birla Group of Companies.

The above table showed interest coverage ratio of Birla Power & Solution Ltd. The average ratio was 4.49, which was 104.18 percent higher than the average of Birla Group of Companies. The ratio showed fluctuated trend ranging from 1.32 times in 2002-03 to 6.19 times in 1999-2000. In most of the years the ratio was above the fourth times. It means that the coverage

fourth times would indicate that a fall in operating earning to only up to one – fourth level can be tolerated.

Table no.-8.3 showed the interest coverage ratio of Birla V.X.L Ltd. The ratio was on an average of 0.19 times ranging from –0.66 times in 2002-03 to 0.98 times in 1997-98. The ratio showed decreased and negative trend during the study period. The firm had the negetive interest coverage ratio after the year of 1999-2000. The ratio was negative because the EBIT was negative in the last three years of the study period. The company was not able to pay the interest to the external parties. For that the company should increase the operating profit.

In Jay Shree Tea & Industries Ltd. the interest coverage ratio showed the downward trend during the study period. The interest coverage ratio was 5.99 times in 1997-98 and in 1998-99 it was 5.58 times. The n after the ratio fell down and showed the decreased trend up to the last years of study period. The average ratio was 2.67 times which 24.18 percent above the Birla Group of Companies was. The interest coverage ratio was very good in the first three years and then the ratio was below one, because the low interest coverage ratio was danger signal that the firm was using excess debt and was not able to pay assured interest to the creditors.

The above table no.-8.3 showed the interest coverage ratio of Zuari Ltd. The ratio had been ranged between –1.22 times in 2002-03 to 2.29 times in 1997-98 during the study period. The average ratio was 0.95 times which less than 55.81 percent was. The interest coverage ratio was not good in 1999-2000 and 2002-03 because the ratio was below one. However the interest coverage ratio was considered low such ratio would indicate the danger signal that the firm is financing excessive debt and does not have the ability to offer assured payment of interest to the creditors.

The interest coverage ratio of Orient Paper Ltd. showed fluctuated trend during the study period. The average ratio was 0.36 times. The average ratio was very low. The interest coverage ratio varied from –0.36 times in

1998-99 to 0.80 times in 2000-01. The interest coverage ratio was not showing the good condition, because the low ratio had not been safety guard to the creditors. The company should increase the operating earning during the study period.

On the basis of above analysis it can be said that the highest interest coverage ratio was in Hindalco Industries Ltd. followed by Indian Rayon & Industries, Birla Power & Solution Ltd., Grasim Industries Ltd., and Jay Shree Tea & Industries Ltd.

The following companies have the interest coverage ratio below the average of Birla Group of Companies such as Hyderabad Cement Ltd., Mysore Cement Ltd., Shree Digvijay Cement Ltd., Birla Corporation Ltd., Century Textiles Ltd., Kesoram Industries Ltd. and other units of Birla Group of Companies.

(3) Fixed Assets to Capital Employed:

This ratio explains the relationship between fixed assets and capital employed v/s equity share capital and retained earnings, preference share capital and debenture and other long-term liability plus working capital. This ratio is an important tool for judging the capital employed in fixed assets. The lesser the ratio the greater the margin of safety for long term creditors. It implies that how much portion of the total capital financed in fixed assets, If the more capital is financed in total assets the return on fixed assets should be high and capital turnover should also be high. So that the firm can earn maximum return, it can be computed as follow:

$$\text{Fixed Assets to Capital Employed} = \frac{\text{Fixed Assets (net)}}{\text{Capital Employed}}$$

Fixed assets to capital employed ratio of Birla Group of Companies are given below.

The table no.-8.4 showed the fixed assets capital employed ratio of Birla Group of Companies.

TABLE NO.-8.4
FIXED ASSEST TO CAPITAL EMPLOYED RATIO OF BIRLA GROUP OF COMPANIES. (In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	0.455	0.58	0.65	0.717	0.818	0.875	**0.683**
MYSORE CEMENT LTD.	0.774	0.819	0.917	0.896	0.831	0.877	**0.852**
SHREE DIG.CEMENT LTD	0.763	1.4	1.68	2.55	1.958	3.604	**1.993**
BIRLA CORPORATIO LTD.	0.776	0.886	0.894	0.837	0.748	0.777	**0.82**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	0.802	0.834	0.919	0.791	1.084	1.137	**0.928**
KESORAM IND. &CO.MILLS.	0.744	0.77	0.724	0.68	0.908	0.961	**0.798**
INDIA RAYON & IND.	0.265	0.511	0.499	0.493	0.491	0.475	**0.456**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	0.675	0.769	0.751	0.798	0.861	0.805	**0.777**
HINDALCO IND. LTD.	0.538	0.484	0.454	0.417	0.486	0.589	**0.495**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.318	0.323	0.603	0.593	0.501	0.535	**0.479**
BIRLA POWER & SOL.LTD.	0.277	0.346	0.298	0.269	0.309	0.275	**0.296**
WOOL INDUSTRY							
BIRLA VXL. LTD.	0.682	0.778	0.582	0.538	0.569	0.564	**0.619**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.359	0.32	0.357	0.41	0.432	0.467	**0.391**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.338	1.598	1.559	0.499	0.507	0.389	**0.982**
PAPER INDUSTRY							
ORIENT PAPER LTD.	0.751	0.843	0.799	0.809	0.777	0.797	**0.796**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.592	0.666	0.673	0.664	0.602	0.575	**0.629**
BIRLA GROUP	**0.632**	**0.745**	**0.772**	**0.748**	**0.743**	**0.856**	**0.749**

SOURCES: COMPUTED FROM ANNUAL REPORTS OF BIRLA GROUP OF CO' S

The fixed assets capital employed ratio showed increased trend. The ratio ranged between 0.632 times in 1997-98 to 0.856 times in 2002-03. The average ratio was 0.749 times it means that the company has invested less than one rupees of capital employed in fixed assets. If a firm invests the capital

employed in fixed assets, firm can earn high rate of return on capital employed.

The fixed assets capital employed ratio of Hyderabad Cement Ltd. was showing the increasing during the study period. The average ratio was 0.683 times, which was 8.81 percent less than the Birla Group of Companies. The fixed assets turnover ratio ranged between 0.455 times in 1997-98 to 0.875 times in 2002-03. The company had used its capital employed in fixed assets in the last three years of study period because the fixed assets were more. The company is advised to invest more capital in fixed assets because it can give more return to the firm.

The above table reveals the fixed assets capital employed ratio of Mysore Cement Ltd. The fixed assets capital employed ratio varied from 0.774 in 1997-98 to 0.896 times in 2001-02 showing increasing trend during the study period. The average ratio of the company had been on an average of 0.852 times. The average ratio was more than Birla Group of Company by 13.75 percent. In most of the years the fixed assets capital employed ratio was satisfactory.

In Shree Digvijay Cement Ltd. the fixed assets to capital employed ratio was showing the trend towards increase. The Fixed assets to capital employed ratio ranged between 1.40 times in 1998-99 to 3.604 times in 2002-03. The ratio average ratio was 1.993 times which was very higher than the Birla Group of company. It had shown that the firm had used the short-term debt in the business also. If the more capital is financed in total assets the return on fixed assets should be high and capital turnover should also be high, so that the firm can earn maximum return,

The fixed asset to capital employed ratio of Birla Corporation Ltd. was seen in the table no.-8.4 the fixed assets turnover ratio indicated the trend towards increase. The ratio was in between 0.748 times in 2001-02 to 0.894 times in 1999-2000 with an average the ratio was 0.820 times. The ratio was low compared to Birla Group of Companies. The lesser the ratio the greater

the margin of safety for long term creditors. Such ratio showed that the company had used its long–term capital fixed assets. It also indicated that employing the capital had purchased the fixed assets.

The Century Textiles Mills showed the fixed assets to capital employed ratio in the above table. The ratio ranged between 0.791 times in 2000-01 to 1.137 times in 2002-03. The average ratio was 0.928 times. It showed that the fixed assets was more than the capital employed in the last three years, such condition indicates that the firm had used short term capital in the fixed assets. The higher ratio indicates the lesser margin of safety for long-term creditors. The firm is advised to employ the long – term capital in the fixed assets.

The above showed the fixed assets to capital employed ratio of Kesoram Industries Ltd. The average ratio was 0.798 times, which was higher than the Birla Group of Companies by 6.54 percent. The ratio was showed increased trend from 0.744 times in 1997-98 to 0.770 times in 1998-99, the ratio declined to 0.724 times in 1999-2000. Then the ratio showed the increased trend up to the last years of study period. The higher ratio was not a good indicator for creditors. The firm should use more long capital in financing the fixed assets.

The fixed assets to capital employed ratio of Grasim Industries Ltd. were manifested in the above table no.-8.4. The ratio was showed the trend towards increase. The ratio ranged between 0.575 times in 2002-03 to 0.673 times in 1999-2000 with an average of 0.629 times. The ratio, in most of years was below the Birla Group of Companies. The in most of years the fixed assets were lower than the long term capital. The firm had taken a wise decision because it can give good return to the firm; moreover it gives the margin of safety to the creditors.

The ratio of fixed assets to capital employed of Indian Rayon & Industries Ltd. was towards decrease. The firm had showed the ratio on an average of 0.456 times, which was less than the Birla Group of Companies by 39.12 percent. The ratio varied from 0.265 times in 1997-98 to 0.511 times in

1998-99. The lower ratio was good from the point of view of creditors, because the firm had financed less long term capital in fixed assets during the study period.

The fixed assets to capital employed ratio Hindustan Motor Ltd. was seen in the above table. The ratio fluctuated from 0.675 times in 1997-98 to 0.861 times in 2001-02. The average ratio was 0.777 times which was greater than the Combined Birla Group of Companies. The capital employed in fixed assets was showed increased trend during the study period.

The fixed assets to capital employed ratio of Hindalco Ltd. were showing the trend towards increase. The ratio was in between 0.417 times in 1999-02 to 0.589 times in 2002-03 with an average of 0.495 times. The average ratio was below the average of Birla Group of Companies. The ratio showed that the company had good capital budgeting decision because the fixed asset was financed by employing the long-term capital. The company is also getting good rate of return over long-term capital.

The fixed asset to capital employed ratio of Texmaco Ltd. was seen in the table no.-8.4. The fixed assets capital employed ratio indicated the trend towards and decrease. The ratio was in between 0.318 times 1997-98 to 0.603 times in 1999-2000 with an average the ratio was 0.479 times. The ratio was lower than the Birla Group of Companies. The lesser the ratio indicates the greater the margin of safety for long-term creditors. Such ratio showed that the company had used its long term capital fixed assets. It is also indicated that the fixed assets had been purchased by employing the long term in the business. The firm is advised to invest more long term capital in the business.

The fixed assets capital employed ratio of Birla Power & Solution Ltd. was showing the increasing up to 2001-02 then after the ratio declined in the year of 2002-03 with an average ratio was 0.296 times, which was 60.48 percent less than the Birla Group of Companies. The fixed assets turnover ratio ranged between 0.269 times in 2000-01 to 0.309 times in 2001-02. The company had used its capital employed in fixed assets in the during the study

period because the fixed assets was less than the capital. The company is advised to invest more capital in fixed assets because it can give more return to the firm.

The fixed assets to capital employed ratio of Birla VXL Ltd. were manifested in the above table no.-8.4. The ratio was showed the trend towards decrease. The ratio ranged between 0.538 times in 1999-2000 to 0.778 times in 1998-99 with an average of 0.619 times. The ratio, in most of years was below the Birla Group of Companies. The in most of years the fixed assets were lower than the long term capital. The firm had taken a wise decision because it can give good return to the firm; moreover it gives the margin of safety to the creditors.

The fixed assets turn over ratio of Jay Shree & Industries Ltd. was showing the trend towards the increase. The average ratio was below the Birla Group of Companies. The fixed assets to capital employed ratio ranged between 0.32 times in 1997-98 to 0.467 times in 2002-03. The average ratio was 0.391 times. The fixed assets capital employed ratio was below the one rupee, which showed that the firm had used more long-term capital in the fixed assets. Shareholder favoured such type of decision because it gives more return to them.

The ratio of fixed assets to capital employed of Zuari Ltd was towards decrease. The firm had showed the ratio on an average of 0.982 times, which was more than the Birla Group of Companies. The ratio varied from 0.389 times in 2002-03 to 1.598 times in 1998-99. In the last three years the ratio was lower which was good from the point of view of creditors, because the firm had financed more long term capital in fixed assets during the study period.

The above table showed the fixed assets to capital employed ratio of Orient Paper Ltd. The ratio showed the fluctuated trend during the study period. The ratio ranged between 0.751 times in 1997-98 to 0.809 times in 2000-01. The average ratio was above the Birla Group of Companies. The

ratio fluctuated less than one times during the study period. Thus the ratio less than one times showed that the fixed assets are financed by long term capital which was safety guard for creditor.

On the basis of the above it can be said that the fixed assets ratio was good and more than the Birla Group of Companies of Shree Digvijay Cement Ltd., Jay Shree Tea & Ind. Ltd., Century Textiles Ltd., Mysore Cement Ltd., Hindustan Motors Ltd., Zuari Ind. Ltd. and Birla Corporation Ltd. and other units had very less than the Birla Group of Companies

(4) Capital Gearing Ratio:

The term capital gearing indicates the relative proportion of fixed cost capital as represented by the preference share capital and debt capital to the ordinary share capital. When both type of capital i.e. equity capital and debt capital such type of capital is said to be highly geared. If the former is higher in proportion to the later, the capital is said to be low geared. Proportion, which the preference share capital plus debt capital bears to the equity share capital, is known as leverage. Optimum gearing of the capital structure may be high or low according to the nature of business. This ratio indicates the extent of trading on equity which means that equity share capital is being held, as a base for getting finance in the form of preference share capital and long-term borrowing with low geared ratio. The capital gearing ratio Generally 1:1 .The risk is at the minimum but the profit will also be lower. Hence, a proper balance between high geared and low- geared capital structure has to be work out to have a sound management of capital. The Formula for the derivation of capital gearing ratio is given below

$$\text{Capital Gearing} = \frac{\text{Loan Capital + Preference Capital}}{\text{Equity Share Capital}}$$

High gearing is to be employed during inflationary conditions just like a motorist does it when he finds a straight downward comfortable lopor clear

road. In such a situation a lion' s share of profit shall go to the shareholders. In a period of trade depression low gearing is to be employed in the same way as a driver who changes to low gearing when driving upwards.

A successful blending of different sources of funds employed in a business concern is desirable from the point of view of investors, creditors and concerns itself. With the knowledge of proper capital gears the financial managers is also able to conduct a business successfully in a period of trade cycle. The following table shows the capital- gearing ratio of Birla Group of Companies

Table No.-8.5
Capital Gearing Ratio of Birla Group of Companies.(In times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	1.518	1.95	3.553	14.143	7.947	18.426	**7.923**
MYSORE CEMENT LTD.	1.252	1.356	1.696	2.176	2.003	1.919	**1.733**
SHREE DIG.CEMENT LTD	2.773	0	0	0	0	0	**0.462**
BIRLA CORPORATIO LTD.	1.748	2.528	1.572	1.205	1.265	1.249	**1.594**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.686	1.913	1.808	1.691	2.042	1.627	**1.794**
KESORAM IND. &CO.MILLS.	0.436	0.393	0.469	0.581	0.618	0.683	**0.53**
INDIA RAYON & IND.	0.64	0.46	0.54	0.41	0.42	0.23	**0.45**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.683	2.561	3.408	1.937	2.298	2.823	**2.451**
HINDALCO IND. LTD.	0.284	0.211	0.151	0.163	0.209	0.387	**0.234**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.461	0.634	0.498	0.72	1.117	1.336	**0.794**
BIRLA POWER & SOL.LTD.	0.695	0.428	0.373	0.294	0.323	0.699	**0.469**
WOOL INDUSTRY							
BIRLA VXL. LTD.	2.07	2.638	2.006	5.568	8.519	39.876	**10.11**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.436	0.393	0.469	0.581	0.618	0.683	**0.53**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.517	1.559	1.81	0.825	1.018	1.471	**1.367**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.171	4.495	13.182	58.351	25.568	33.739	**22.917**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	0.92	0.93	0.82	0.62	0.62	0.58	**0.748**
BIRLA GROUP	**1.268**	**1.403**	**2.022**	**5.579**	**3.411**	**6.608**	**3.381**

SOURCES: COMPUTED FROM ANNUAL REPORTS OF BIRLA GROUP OF CO'S.

The above table showed the capital-gearing ratio of Birla Group of companies. The ratio ranged between 1.268 times in 1997-98 to 6.608 times in 2002-03 with an average of 3.338 times. The trend was towards fluctuated and increases. The Birla Group of Companies had used loan capital and preference share capital more than the equity share capital in most of the years during the study period. The ratio was more than the standard norm of 1:1. It indicated high-geared ratio, which was benefited to the company to increase the value of the share in the market.

The above table no.-8.5 showed capital gearing ratio of Hyderabad Cement Ltd. The capital-gearing ratio showed the increased trend during the study period. The average ratio was 7.792 times ranging between 1.518 times in 1997-98 to 18.426times in 2002-03. The ratio was more than the standard norms of 1:1, which showed the capital structure, were high geared during the study period. The company had taken the advantages of leverage.

In Mysore Cement Ltd. The capital-gearing ratio was towards increase. The ratio ranged between 1.252 times in 1997-98 to 2.179times in 2000-01 with an average of 1.733 times. The average ratio was more than the Birla Group of Companies. The ratio in most times was above the Norms of 1:1. It indicated that the capital structure was high geared and had given the benefit of leverage to the company. The company should not use more preference share capital and loan capital in the capital structure.

The table no.-8.5 reveals the capital-gearing ratio of Shree Digvijay Cement Ltd. The capital-gearing ratio was showing the 2.773 times in 1997-98 then after it was zero during the study period. The ratio was zero because after 1997-98 the net worth was minus and company had used the debt. The company is advised to increase the net profit. The capital-gearing ratio was low and it indicated that the company had no advantages of trade on equity

The capital-gearing ratio of Birla Corporation Ltd. was seen in the above table no.-8.5. The capital-gearing ratio was showing decrease trend during the study period. The ratio ranged between 1.205 times in 2000-01 to

2.528 times in 1998-99 with an average of 1.594 times. The ratio was higher than the ratio of Birla Group of Companies and also showed capital structure high geared. The ratio was following the standard norms of 1:1.

The capital-gearing ratio of Century Textiles Ltd. was manifested in the above table. The capital-gearing ratio was varying from 1.627 times in 2000-03 to 2.042 times in 2001-02. The ratio was declined in the last year to 1.627 times. The average ratio was 1.794 times which was above the average of Birla Group of Companies. The ratio followed the standard norm of 1:1, and showed the capital structure high geared during the study period.

The capital-gearing ratio was of Kesoram Textiles Mills seen in the above table no.-8.5 the ratio was indicating the trend towards fluctuated and mix trend. The ratio varied from 0.393 times in 1998-99 to 0.683 times in 2002-03. The ratio followed the standard norm of 1:1. The average ratio was 0.53 times which was less than the average of Birla Group of Companies. The capital structure was low geared during the whole time of period. The company had no benefit of trade on equity.

The capital structure ratio of Indian Rayon Ind. Ltd. was shown in the above table. The ratio ranged between 0.23 times in 2002-03 to 0.64 times in 1997-98 with an average of 0.45 times. The capital-gearing ratio was below the one time during the study period. It had not followed the standard norm of 1:1. The ratio showed the capital structure low geared.

Table No.-8.5 showed capital gearing ratio of Hindustan Motor Ltd. The ratio varied from 1.683 times in 1997-98 to 2.561 times in 1998-99 with an average of 2.451 times.The ratio showed increased trend from 1.683 times in 1997-98 to 3.408 times in 1999-2000. Then the ratio declined to 1.937 times but after the ratio increased and stable at 2.823 times. The ratio was high geared during the study period. The high-geared ratio can offer the advantage of trade on equity to the company.

The Table No.-8.5 indicated the capital-gearing ratio of Hindalco Ltd. The capital gearing ratio was showing increasing trend ranging from 0.151

times in 1999-2000 to 0.387 times in 2002-03 with an average of 0.234 times. The ratio was not following the norms of 1:1. The ratio also showed the capital structure was very low during the study period. The low-geared capital structure showed that the company had not taken the benefit of leverage.

The capital-gearing ratio of Texmaco Ltd. was showing increasing trend during the study period. The marked capital-gearing ratio on an average of 0.794 times ranging from 0.461 times in 1997-98 to 1.336 times in 2002-03. The capital-gearing ratio from 1997-98 to 2000-01 was low geared then after the ratio increased from 2001-02; the ratio began to increase up to the last year of study period. In the last two years of study period the ratio was above the one times, it means that the ratio was high geared in the last two years.

Table No.-8.5 described that the capital gearing ratio of Birla Power & Solution Ltd. The capital-gearing ratio of company showed increasing trend after the first year of study period. The ratio ranged between 0.294 times in 2000-01 to 0.6.99 times in 2002-03. In most of the years the ratio was below the standard norm of 1:1. Such kind of ratio was marked as low geared, so company is advised to increase the ratio by using the long-term debt & preference share capital.

The above table showed the capital-gearing ratio of Birla VXL Ltd. The capital ratio ranged between 2.006 times in 1999-000 to 39.876 times in 2002-03 with an average of 10.11 times. The average ratio was second highest among the selected units of Birla Group of Companies. The capital-gearing ratio showed that the capital structure of the company was high geared during the study period. The company had used more loan and preference share capital in the business. Too high capital gearing ratio was not good for the firm because the firm may not pay enough interest on their capital, so it is advised to company to reduce the gearing ratio.

In Jay Shree Tea & Industries Ltd. the capital-gearing ratio was invariably marked as increasing trend during the study period. The ratio varied from 0.393 times in 1998-99 to 0.683 times in 2000-03. The average ratio was

0.53 times which was less than the average of Birla Group of Companies. The capital gearing ratio was very low and was not followed the standard of 1:1. The capital-gearing ratio in the capital structure was low geared that is why; the firm is advised to increase the long-term debt in the capital structure.

The capital-gearing ratio Zuari Ltd was manifested in the above table. The capital-gearing ratio was varying from 0.825 times in 2000-01 to 1.81 times in 1999-2000. The average ratio was 1.367 times which was above the average of Birla Group of Companies. The ratio followed the standard norm of 1:1, and showed the capital structure high geared during the study period

The Table No.-8.5 manifested that the capital-gearing ratio of Orient Paper Ltd. was showing increasing trend during the study period. The capital gearing ratio ranged between 2.171 times in 1997-98 to 58.351 times in 2000-01 with an average of 22.917 times. The average was the highest among the Birla Group of the Companies. The highest capital gearing is good for the company but too high capital gearing ratio was not good for the company because it increases the risk of fixed deposit investors.

In Grasim Industries Ltd. the capital-gearing ratio was towards decrease. The ratio ranged between 0.58 times in 2002-03 to 0.93 times in 1998-99 with an average of 0.748 times. The average ratio was more than the Birla Group of Companies. The ratio in most times was below the norms of 1:1. It indicated that the capital structure was low geared and had not given the benefit of leverage to the company. The company should use more preference share capital and loan capital to have the standard of 1:1. However it increases the risk of creditors.

On the basis of above the following Companies had high-geared capital structure i.e. Hyderabad Cement Ltd., orient paper Ltd., Birla VXL Ltd., Hindustan Motor Ltd., Century Textiles Ltd, Birla Corporation Ltd., and Mysore Cement Ltd., and other units like Shree Digvijay Cement Ltd., Kesoram Textiles Mills., Indian Rayon Ltd., Hindalco Ltd., Texmaco Ltd., Birla Power & Solution Ltd., Grasim Industries Ltd., Zuari Ltd., Jay Shree Tea

& Ind. Ltd., of the Birla Group of companies had the very lower geared capital structure.

(5) Proprietary Ratio:

It is the ratio of funds belonging to the shareholders to the total assets of the company. Funds belonging to shareholders' means share capital plus reserves and surpluses, both of capital and revenue nature. Losses should be deducted. Funds payable to others should not be added. Higher the ratio, better it for all concerned. It is worked out as:

$$\text{PROPRIETARY RATIO} = \frac{\text{PROPRIETARY' S FUNDS}}{\text{TOTAL ASSETS}}$$

This ratio indicates the proportion to total assets financed by owners. Generally this ratio may be 70 to 75 percent. The higher ratio increases the profit, and it lessees the interest burden of the company. However it depends upon the nature of the business. Even though if it high good for the company but too high ratio is not good for the company. The proprietary ratio of Birla Group of Companies is given below.

Table No.-8.6 showed proprietary ratio of Birla Group of Companies. The ratio was indicating the decreasing trend during the study period. The ratio ranged between 24.177 percent in 2002-03 to 39.992 percent in 1997-98 with an average of 31.423 percent. The ratio very low because of the owner' s fund was not required to employ in total assets. However, it should be 70 to 75 percent.

The proprietary ratio of Hyderabad Cement Ltd. was seen in the above table. The ratio marked downward trend with the average of 27.373 percent. The ratio ranged 22.399 percent in 2002-03 and 34.05 percent in 1997-98. The ratio was very low compared to standard. The owner' s fund was on an average only 27.373 percent, so company is advised to invest more net worth in total assets.

In Mysore Cement Ltd. the proprietary ratio was manifested in the above table. The proprietary ratio marked downward trend and ranged from 4.041 percent in 2002-03 to 35.119 percent in 1997-98. The average ratio was 16.966 percent, which was less than the Birla Group of Companies.

TABLE. No.-8.6
PROPRIETARY RATIO OF BIRLA GROUP OF COMPANIES (In percent)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	34.05	33.958	25.863	24.682	23.286	22.399	**27.373**
MYSORE CEMENT LTD.	35.119	29.861	18.185	5.468	9.12	4.041	**16.966**
SHREE DIG.CEMENT LTD	14.189	-54.64	-60.62	-81.559	-70.985	-94.734	**-58.058**
BIRLA CORPORATIO LTD.	30.153	22.581	28.535	33.438	30.93	30.961	**29.433**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	35.828	33.318	32.881	32.835	23.733	26.897	**30.915**
KESORAM IND. &CO.MILLS.	37.172	39.692	38.683	30.671	29.177	29.837	**34.205**
INDIA RAYON & IND.	61.817	68.541	64.284	71.004	70.367	81.089	**69.517**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	27.783	18.493	15.537	22.429	19.877	16.941	**20.177**
HINDALCO IND. LTD.	74.306	79.341	83.431	82.577	72.669	60.843	**75.528**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	35.998	36.047	37.8	36.904	33.147	28.316	**34.702**
BIRLA POWER & SOL.LTD.	46.235	51.021	57.877	60.971	53.603	44.699	**52.401**
WOOL INDUSTRY							
BIRLA VXL. LTD.	29.513	24.484	30.878	13.18	9.401	1.99	**18.241**
TEA INDUSTY							
JAYSHREE TEA & IND.	60.258	62.017	58.635	55.784	50.276	48.829	**55.967**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	34.153	32.208	25.314	40.344	36.083	27.888	**32.665**
PAPER INDUSTRY							
ORIENT PAPER LTD.	25.077	14.352	5.516	1.312	2.729	2.018	**8.501**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	52.939	48.742	51.996	63.774	53.59	54.818	**54.309**
BIRLA GROUP	**39.992**	**33.751**	**32.175**	**30.863**	**27.937**	**24.177**	**31.423**

SOURCES: COMPUTED FROM ANNUAL REPORTS OF BIRLA GROUP OF CO' S.

The Mysore Cement Ltd. also had less amount of owner' s funds in total assets. The ratio was low, such ratio decrease profit and increases the interest burden of the company, so company is advised to increase the proprietary ratio to earn more profit on net worth.

The above table no.-8.6 showed the proprietary ratio of Shree Digvijay Cement Ltd. The proprietary ratio indicated the downward and minus trend during the study period. The ratio was in most of years minus. It is because of Negetive net worth after the first year of study period. The company is advised to increase the net profit.

Table No.-8.6 marked proprietary ratio of Birla Corporation Ltd. The ratio showed mix and upwards trend during the study period ranging between 22.581 percent in 1998-99 to 33.438 percent in 2000-01. The average ratio was 29.433 percent, which was less than average of Birla Group of Companies. The proprietary ratio was very low because it should be near by 70 to 75 percent. The firm is advice to enhance the proprietary ratio to earn more profit on net worth.

Table No.-8.6 showed the proprietary ratio of Century Textiles Ltd. The ratio was showing the decreased trend during the study period. The ratio varied from 23.733 percent in 2001-02 to 35.828 percent in 1997-98. The average ratio was 30.915 percent. The ratio showed that the owners' funds invested in total assets very low. The most of assets purchased by using the long-term debt, Some times it may happen that the firm has to sell its assets to pay the creditor.

Table No.-8.6 showed the proprietary ratio of Kesoram Mills Ltd.. In this company the ratio was performing the fluctuated trend during the research period. The proprietary ratio of the company was the highest 39.692 percent in 1998-99 and the lowest ratio was 29.177 percent in 2001-02. The average ratio was 34.205 percent. The average ratio was below the average of Birla Group of Companies. The proprietary ratio was less than 50 percent. By observing the ratio it can be said that more than 60 percent of total assets ware purchased by using the long-term debt, such policy was not good for business.

Table No.-8.6 showed proprietary ratio of Indian Rayon & Industries Ltd. The proprietary ratio of the company was invariably marking an upward trend. The ratio was on an average of 69.517 percent ranging from 48.742

percent in 1998-99 to 54.818 percent in 2002-03. The proprietary ratio was very good and the ratio was also second highest among the selected units of Birla Group of Companies. The firm had earned good profit on the net worth.

The proprietary ratio of Hindustan Motor Ltd. was seen in the above table. The proprietary ratio was showed decreased trend during the study period with an average of 20.177 percent. The proprietary ratio ranged between 15.537 percent in 1999-2000 to 27.873 percent in 1997-98. The ratio was not followed the standard of 70 to 75 percent. The proprietary ratio was very low, so firm has to increase.

The above Table No.-8.6 showed that the proprietary ratio of Hindalco Industries Ltd., which marked increased trend during the study period. The average ratio was 75 percent, which considered very well. The ratio ranged between 67 percent in 1998-99 to 84 percent in 2000-01. The ratio followed standard norms of 70 to 75 percent. The ratio showed that the owners of the company had used net worth to purchase the total assets.

In Birla VXL Ltd. the proprietary ratio marked a decreasing trend during the study period. The ratio was ranging 2 percent in 2002-03 and 29 percent during the study period. The average ratio was 17.83 percent, which was very less than the average of Birla Group of Companies. The firm is advised to enhance the proprietary ratio.

The proprietary ratio of texmaco ltd was seen in the above table. The ratio showed increased trend from 29 percent in 1997-98 to 32 percent in 2001-02 then after the ratio-decreased up to last years of study period. The average ratio was 28.67 percent, which was considered very low, so the firm is advised to use more proprietary' funds in total assets.

The proprietary ratio of Birla Power & Solution Ltd. was showing the fluctuated trend during the study period. The average ratio was 32.33 percent ranging from 26 percent in 2002-03 to 37 percent in 2000-01. The ratio was very lower from the combined average of Birla Group of Companies. The company should increase the ratio by employing more owner' s funds.

The above table no.-8.6 showed proprietary ratio of Jay Shree Tea & Industries Ltd. The ratio ranged between 49 percent in 2002-03 to 62 percent in 1998-99 with an average of 56 percent. The ratio was showed the trend towards decrease. However it was better in this company because it had the third highest proprietary ratio.

Table No.-8.6 showed proprietary ratio of Zuari Ltd. The proprietary ratio of the company was invariably marking an upward trend. The ratio was on an average of 37.5 percent ranging from 24 percent in 1999-2000 to 46 percent in 2001-02. The proprietary ratio was not good and the firm should increase the ratio.

The proprietary ratio of Orient Paper Ltd was seen in the above table. The ratio showed decreasing trend. The ratio ranged between 1 percent in 2000-01 to 22 percent in 1997-98. The average ratio was very low in this company, so company is to advise increase the ratio.

The proprietary ratio of Grasim Industries Ltd. showed increasing trend during the study period. The ratio was ranging between 52 to 76 percent, with an average of 61 percent. The ratio was in the last two years good but in the first four years of study period the ratio was near 50 percent. The ratio was the second highest among the selected units of Birla Group of Companies.

On the basis of above analysis it can be said that the highest proprietary ratio was in 75 percent in Hindalco Ltd. followed by Indian Rayon & Industries Ltd., Jay Shree Tea & Industries Ltd., Zuari Ltd., Birla Power & Solution Ltd., and Birla Corporation Ltd., while other had the proprietary ratio less than the average of Birla Group of companies.

(6) Fixed Assets to Net-Worth Ratio:

This ratio explains the relationship between fixed assets and tangible net worth, viz., preference share capital, equity share capital and retained earnings. This ratio is an important tool for judging the margin of safety for long-term creditors. The lesser the ratio the greater the margin of safety for long term creditors. If the net worth is less than fixed assets, it implies that the

loan funds are used to finance a part of the fixed assets, when the amount of ownership funds exceeds the value of fixed assets a part of the net working capital is provided by the shareholders. The yardstick for this measure is 65 % for industrial undertaking. It means that 65% of ownership funds are to be used for acquiring fixed assets and rest for financing current assets. The ratio is calculated as below: -

$$\text{Net Fixed Assets to Net worth Ratio} = \frac{\text{Net Fixed Assets}}{\text{Net Worth}} \times 100$$

Table No.-8.7
FIXED ASSETS TO NET-WORTH RATIO OF BIRLA GROUP OF COMPANIES (In Times)

COMPANY	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	AVE.
CEMENT INDUSTRY							
HYDERABAD IND. LTD.	0.779	1.039	1.405	1.671	1.759	1.817	**1.412**
MYSORE CEMENT LTD.	1.663	2.025	3.332	10.945	6.07	13.41	**6.241**
SHREE DIG.CEMENT LTD	2.53	-0.967	-0.855	-0.775	-0.699	-0.531	**-0.22**
BIRLA CORPORATIO LTD.	1.835	2.562	1.871	1.551	1.543	1.504	**1.811**
TEXTILES INDUSTRY							
CENTURY TEX. & IND.	1.764	1.931	2.011	1.738	2.496	2.228	**2.028**
KESORAM IND. &CO.MILLS.	1.637	1.618	1.574	1.656	1.821	1.705	**1.669**
INDIA RAYON & IND.	1.042	0.746	0.77	0.695	0.698	0.584	**0.756**
AUTO & ALUMINIUM IND.							
HINDUSTAN MOTORS LTD.	1.593	2.143	2.689	1.943	2.321	2.519	**2.201**
HINDALCO IND. LTD.	0.682	0.583	0.519	0.484	0.582	0.775	**0.604**
ENGINEERING INDUSTRY.							
TEXMACO LTD.	0.335	0.424	0.786	0.874	0.919	1.049	**0.731**
BIRLA POWER & SOL.LTD.	0.442	0.434	0.351	0.291	0.342	0.307	**0.361**
WOOL INDUSTRY							
BIRLA VXL. LTD.	1.679	2.062	1.409	3.433	5.018	21.212	**5.802**
TEA INDUSTY							
JAYSHREE TEA & IND.	0.483	0.437	0.46	0.574	0.669	0.695	**0.553**
AGRO- INDUSTRY							
ZUARI INDUSTIES LTD.	1.684	1.865	2.02	0.614	0.629	0.492	**1.217**
PAPER INDUSTRY							
ORIENT PAPER LTD.	2.073	3.944	10.152	43.104	18.33	24.056	**16.94**
DIVERSIFIED INDUSRY							
GRASIM IND. LTD.	1.137	1.282	1.225	1.074	0.975	0.905	**1.1**
BIRLA GROUP	**1.334**	**1.383**	**1.857**	**4.367**	**2.717**	**4.545**	**2.70**

SOURCES: COMPUTED FROM ANNUAL REPORTS OF BIRLA GROUP OF CO' S.

The above table showed net fixed assets to net-worth ratio of Birla Group of Companies. The ratio indicated highly fluctuated trend through the study period. The ratio was 1.334 times in 1997-88 which the slightly went up to 1.383 times in 1998-99. The ratio was 1.857 times in 1999-2000 and it reached at the top of 4.367 times in 2000-01. After this year the ratio was 2.717 times in 2001-02 and it was very high 4.545 times in 2002-03. The average ratio was 2.70 times. In most of the years the ratio was more than the one it meant that the debt was also used in financing the fixed assets.

The net fixed asset to net-worth ratio of Hyderabad Cement Ltd. was showing the increased trend throughout the research period. The ratio ranged between 0.779 times in 1997-98 to 1.817 timesi n 002-03 with an average of 1.412 times. The average ratio was more than the combined average of Birla Group of Companies. The ratio showed that the fixed assets were financed from the long-term debt of also.

The net fixed assets to net-worth ratio of Mysore Cement Ltd. was seen in the above table 8.7.The ratio manifested the mix and fluctuating trend. The ratio varied from 1.663 times in 1997-98 to 13.41 times in 2002-03. The average ratio was 6.241 times, which more than the Birla Group of Companies.

In Digvijay Cement Ltd. net fixed assets to net-worth ratio shoed negative trend after first years of the study period. The ratio was negetive because of negetive net worth.

The table no.-8.7 showed the net fixed assets to net-worth ratio of Birla Corporation Ltd. The ratio showed fluctuated trend through out the study period. The ratio was ranged between 1.504 times in 2002-03 and 2.562 times in 1998-99 with an average of 1.811 times. The ratio was above the standard norm of 65 percent, which means that the fixed assets were more than the net worth.

The net fixed assets to net-worth ratio of Century Textiles Ltd was seen in the above table. The ratio showed fluctuated trend thought the study

period. The ratio was 1.764 times in 1997-98 to 1.931 times in 1998-99. The ratio then after rose to 2.011 times in 1999-2000 and then it went down to 1.738 times in 2000-01. In the last three years the ratio was more than two, which indicated that the debt also used in financing fixed assets. The average ratio was 2.028 times which more than the combined average of Birla Group Companies.

The net fixed asset to net-worth ratio of Kesoram Mills Ltd. registered fluctuating trend during the study period. The ratio ranged between 1.574 times in 1999-2000 and 1.821times in 2001-02 with an average of 1.669 times. The company had used the debt in the fixed assets

The net fixed asset to net-worth ratio of Indian Rayon & Ind. Ltd was shown the downward trend during the research period. The ratio was 1.042 times in 1997-98 and the declined to 0.746 times in 1998-99. It was 0.77 timesi n 1999-2000 and 0.695 times in 2000-01. In the last years of the study period the ratio was declined to 0.584 times. The average ratio was 0.756 times which was lower than the Birla Group of Companies.

The net fixed assets to net-worth ratio of Hindustan Motors Ltd. was showing varying trend during the study period with an average of 2.201 times. The ratio varied from 1.593 times in 1997-98 to 2.689 times in 1999-2000.

The net fixed assets to net-worth ratio of Hindalco Ltd was showing fluctuated trend during the study period. The ratio was fluctuated from 0.484 times in 2000-01 and reached at highest level of 0.775 times in 2002-03 with an average of 0.604 times. The ratio was below than the one times which was good for the company.

In Texmaco Ltd. net fixed assets to net-worth ratio indicated that the highest 1.0485 times in 2002-03 and the lowest ratio 0.335 times in 1997-98. The average ratio was 0.731 times. The average ratio was satisfactroy; the company had financed fixed assets through net worth.

The net fixed assets to net-worth ratio of Birla Power & Solution Ltd was manifested in the above table. The ratio registered don ward trend through

study period. The ratio declined from 0.442 times in 1997-98 to 0.434 times in 1998-99. The ratio was 0.351 times in 1999-2000 than it went down to 0.291 times in 2000-01. In the last two years of the study period it was 0.342 times and 0.307 times. The average ratio was 0.361 times. The net fixed asset to net-worth ratio was satisfactory.

The net fixed asset to net-worth ratio of Birla V.X.L Ltd. was showed mix and fluctuated trend during the study period. The ratio ranged between 1.409 times in 1999-2000 and 21.212 times in 2002-03. The average ratio was 5.802 times.

The net fixed assets to net-worth ratio of Jay Shree Tea & Ind. Ltd showed increased trend during the study period. The ratio was increased from 0.483 times in 1997-98 to 0.695 times in 2002-03. The average ratio was 0.553 times. In most of the years the ratio was below one, which was satisfactory because the firm had used the net worth the financing the fixed assets

The net fixed asset to net-worth ratio of Zuari Ltd was seen in the above table. The ratio varied from 0.614 times in 2000-01 and 2.02 times in 1999-2000. The average ratio was 1.217 times. The ratio was good in the last three years.

The net fixed asset to net-worth ratio of Orient Paper Ltd was manifested in the above table. The ratio was increased during the study period. The ratio was varying from the lower of 2.073 times in 1997-98 to highest of 43.104 times in 2000-01. Average ratio 16.94 times which was not satisfactory.

The net fixed assets to net-worth ratio of Grasim Ind. showed decreasing trend during the study period. The ratio ranged from 0.907 times in 2002-03 and 1.282 times in 1998-99 with an average of 1.10 times. The ratio was good in the last three year of the study period.

On the basis of above analysis it was found that the net fixed assets to net-worth ratio of Hindalco Ltd., Texmaco Ltd., and Jay Shree Tea & Ind Ltd.

was very good because it was near the yardsticks. The lesser the ratio the greater the margin of safety for long term creditors.

CONCLUSION:

The long – term creditors would judge the soundness of a firm on the basis of the long- term financial strength measured in term of its ability to pay the interest regularly as well as repay the installment of the principal on due dates or in one lump sum at the time of maturity. Long term solvency of a firm can be examined by using capital structure ratios such as [1] debt – equity ratio [2] interest coverage ratio [3] capital gearing ratio [3] Fixed assets to capital employed ratio [4] proprietary ratio.[5] fixed assets to net-worth

Above analysis gives information to creditors about capital structure and firm' s ability to interest and principal amount of long – term debt.

REFERNCES:

1. JOHN N. MAYER, Financial statement analysis, prentice Hall of India, New Delhi, 1947,P.178
2. KULSHRESHTHA N.K., Analysis of Financial statements Indian paper industry, Navman prakashan, aligarh, 1961,p.103
3. WESEL.H. Principles of Financial analysis, Macmillan, new York, 1961,p.141
4. Ibid, P.103
5. WALKER AND BAUGHN, p.87
6. KULSHRESHTRA p.83
7. BRIGHAM E.F., Fundamental of financial management, The Dryden press Hinsdale, Illinois, 1978.
8. WRIGHT M.G., Financial Management, Tata McGraw-Hill publishing Co. New Delhi, 1978, p.201.

CHAPTER – 9
SUMMARY, CONCLUSION AND SUGGESTIONS

CHAPTER-1: CONCEPTUAL FRAMWORK OF LIQUIDITY, PRODUCTIVTY, PROFITABILITY AND FINANCIAL EFFICIENCY

Present study deals with the study of liquidity, productivity viz a viz-financial efficiency of Birla group of companies, which are mainly engaged in the production of cement, textiles, auto, aluminum, engineering, woolen, tea, agro and paper.

The study is made to analyze the liquidity, productivity, profitability and financial efficiency and effectiveness of various activities in deferent areas of operation of an organization. In the interest of getting good working results, every enterprise should have a periodical analysis of its performance. The areas of the analysis are liquidity position, productivity, financial efficiency, activity of the business and financial structure analysis. For that the conceptual framework of liquidity, productivity, profitability, activity and financial structure is given. The objective of this study is detailed cause and effect study of the efficiency and effectiveness in the use of resources available in the business enterprise. The importance and usefulness of liquidity productivity, profitability financial efficiency analysis of business are different for various users of the information such as for Financial managers, investor, and shareholders, creditors, employees, Big business Houses, Government, Society etc. For Financial managers this study is devises to measure the over all effectiveness of their own plans and policies. Investors and Shareholders are interested in the current and long term profitability of their investment. The employees, Shareholders, and Government are interested in the profits of a company. The society also expects to know about the social performance such as environmental obligations, employment, avenues, Social welfare etc.

The techniques, which are commonly used for the study, are such as ratio analysis, trend analysis, comparative statement analysis etc. Statistical

techniques are also used for the purpose and they generally include the average, index, Kruskal Wallis one-way analysis of variance, Chi-quare test, Standard deviation, variance etc. Diagrams, Graphs and Charts are also prepared and made use of.

CHAPTER–2: PROFILE OF BIRLA GROUP OF COMPANIES

The Birla Group of Companies in India plays an important role to develop the Indian economy. Which are mainly engaged in manufacturing the Cement, Textiles, auto& alluminuim, engineering, wool, agro-products, paper, roller, electric, jute/met and tea. So the brief profile of industrialization is also given in this chapter, which includes the introduction of the industrialization, industry structure, process & cost dynamic, current scenario, Demand drives, Government policy, policy impact, Global perspective, recent trend, Future outlook, import –export position with tabulation. Besides this The Brief history of Birla group has been covered such as History & development, family background, contribution to nation and to the society, overseas operation, new family set-up, prospect of Birla group in India. In the last the brief introduction of selected units has been given, which included the ownership of the industry, main product, and incorporation of years.

CHAPTER-3: RESEARCH METHODOLOGY:

The subject of the present study is "A study of liquidity, productivity vis-a vis financial efficiency of Birla group of companies", which covers the period of the last six years from 1997-98 to 2002-03. The study covers the large plants of Birla group. The study is based on secondary data published by the Birla group of companies in their annual reports and accounts. The main objective of the study is to know the liquidity position, Critical analysis of productivity, financial efficiency, activity and financial structure of the 16^{th} selected units of Birla group of companies. The chapter covers the problem identification survey of the existing literature and Various statistical measures

like mean, standard deviation, regression, index number, have been used and least-quare trend, qui-square of productivity have been fitted, Kruskal Wallis one way-analysis of variance test and ' X' test have been applied to test the validity of two hypotheses namely (1) Null hypothesis (2) Alternative hypothesis. Finally the limitations of present study have been shown.

CHAPTER-4: ANALYSIS OF LIQUIDITY:

The liquidity is preserved and protected by managing the working capital. The working capital has been defined two ways: The difference between current assets and current liabilites (Net working capital aproach) and the total of current assets employed (Gross working capital approach). For the purpose of the liquidity analysis net working capital approach has been taken in to consideration. The utilization and management of working capital were analyzed through different ratios.

1. Remarkably, the current ratio of Indian Rayon & Ind., Hindalco, Jayshree Tea & Industires, and Grasim Industries was more than the norm of 2:1. It means the solvency position of other fifteen companies was poor and and precarious, Combined current ratio of Birla Group was 1.695 times. Yet in Hyderabad Cement Ltd, Birla Corporation Ltd., Century Textiles Ltd., Kesoram Textiles Ltd., Hindustan Motor Ltd., Texmaco Ltd., Birla V.X.L Ltd., Zuari Ltd., and Orient Paper Ltd. The solvency position was very sound and sort term creditors position regarding thir caims was safe because companies had sufficient funds in the form of current assets to meet their claims.

2. Kruskal Wallis one-way analysis of variance test was used to the Null hypothesis and Alternative hypothesis of the current ratio of Birla Group of Companies. On the basis of the test, it can be concluded that the Critical value was less than the calculated value and the difference between the current ratio of Birla Group of Companies was significance.

3. In general the quick ratio has been higher than the norm of 1:1 in Hindalco Ltd., Indian Rayon Ltd., Jayshree Tea & Industries Ltd. and Grasim Industries Ltd. The financial position regarding the quick ratio of these companies very sound. Remaining companies ratio was less than one indicated poor liquidit position. Birla Group of Companies as a whole ratio was less than one indicated poor liquid position of companies.

4. Kruskal Wallis test indicated that there was a significance difference between the acid-test/ quick Ratio of Birla Group of Companies.

5. The inventory to working capital ratio was not atisfacory as a whole due to high value inventory; there was insufficient coverage of working capital in companies like Hyderabad Cement Ltd., Birla Corporation Ltd., Century Textiles Ltd., Kesoram Textiles Ltd., Texmaco Ltd., Birla V.X.L Ltd., Zuari Ltd., and Orient Paper Ltd.,However the ratio of Grasim Industries Ltd., Birla Power & Solution Ltd., Texmaco Ltd. Digvijay Cement Ltd. had been near 50 percent which reflects that the liquidity position of these companies was sound. It is suggested remaining companies should try to resuce the volume of inventory.

6. The Kruskal Wallis test rejected Null hypothesis and accepted Null hypothesis, so the difference was significance between the inventories to working capital ratio of Birla Group of Companies.

7. Analysis of working capital turnover reveals that there was better utilisation of working capital in Hyderabad cement Ltd., Century Textiles Ltd., Kesoram Textiles Ltd., Hindustan Motor Ltd., Zuari Ltd., and Orient Paper Ltd. and as in Texmaco Ltd., the turnover was moderate in Kesoram Textiles Ltd., Birla V.X.L Ltd., and in Grasim Industries Ltd., There were negative ratio Birla Corporation Ltd., and Mysore Cement Ltd. during entire study period. Utilisation of working capital in Century Textiles Ltd., Indian Rayon Ltd., Hindalco Ltd., Birla Power & Solution Ltd., and in Jay Shree Tea & Industires Ltd. was very poor.

8. The kruskal Wallis test indicated that the calculated value of H works out at 54.38, which is more than the critical value of 24.996. Hence the rejection of the null hypothesis based on Kruskal Wallis analysis of variance test. The acceptance of alternative hypothesis would indicate that all companies' working capital turnover ratio might not be considered equal.

9. The credit and collection policy of the business must be under continious watch. The debtor' s turnover ratio measures how rapidly debtors are collected. The debtor' s turnover ratio of the Birla Group was 9.13 times on an average. It varied from 8.20 times to 10.65 times. Generally this ratio was highest in 19.84 times of Birla Corporation Ltd. and the lowest being 2.54 times of Birla Power & Solution Ltd. The ratio debtor turnover ratio in Mysore Cement Ltd. Birla Corporation Ltd., Digvijay Cement Ltd. Hindalco Ltd., and Zuari Ltd., was more than 10 times and indicated efficient management of assets.

10. The Kruskal Wallis test showed that the calculated value of ' H' is 71.45, which is more the critical value of 24.99. Hence the Null hypothesis is rejected and Alternative hypothesis is accepted and concluded that there is a significance difference between Debtor turnover ratio Birla Group of Companies.

11. The average collection period of Indian Rayon Ltd., Jay Shree Tea & Industries Ltd., Orient Paper Ltd. Texmaco Ltd., and Grasim Industries Ltd., was more than 50 days. This that these were companies' efficiency of collection of debt from debtors was not good. However, collection period of However, collection period of Mysore Cement Ltd. Birla Corporation Ltd. Hindalco Ltd., Kesoram Textiles Ltd., Century Textiles Ltd., Hindustan Motor Ltd., Zuari Ltd., and Grasim Industries Ltd. was near 30 days indicated companies made collection from their debtors efficiently in short period. It also shows a good liquid position of the companies, as quality of debtors was good. The debt collection period was very bad in Birla V.X.L Ltd. and Birla Power & Solution Ltd.

12. By using the kruskal Wallis one-way analysis it concluded that the there was significance differences between the average debt collection periods of Birla group of companies.

CHAPTER- 5: PRODUCTIVTY ANALYSIS:

Productivity:

Productivity may be defined as the ratio of output to input. Higher the productivity also stands for proper utilization of available resources to achieve the best result with the minimum cost of expenditure. Measurement of productivity is pre-requisite of improvement of productivity in the present study.

MATERIAL PRODUCTIVITY:

Productivity accounting in the case of material involves the following:

1. Material output (net sale)
2. Material input

Computation of material productivity ratio, material productivity indices, co- efficient factor, and material input required per rupees of output.

Productivity ratio reveals output per rupees of any specific or total whatever the case may be as such the ratio indicates the present productivity of Birla Group of Companies. However it does not tell us about the efficiency achieved during the period, which is the main point of concern in this study. So the productivity indices are worked out as percent of base year productivity ratio. The percentage index comes to more than 100; it means the efficient utilization of resources as compared to the base year or vice-versa. It may, however be noted that the changes in productivity data have been worked out with reference to the base year of 1997-98.

1. The Material productivity ratio of Birla group of companies was on an average 2.588. The productivity ratio was found highest in Shree Digvijay Cement industry (3.927) followed by Hindalco Industries Ltd., Birla Corporation Ltd., Jay Shree Tea & Ind. Ltd.,Kesoram Textiles Industries ltd.

Century textiles Ltd.and Orient Paper Ltd., all these companies was efficient in utilizing its material.

2. Other companies like Grasim Industries Ltd., Indian Rayon & Ind Mysore Cement Ltd., Hyderbad Cement Ltd., Texmaco Ltd., Zuari Ind. Ltd.,Birla Power and Solution Ltd.and Hindustan Motor Ltd showed Material productivity ratio on an average below the Birla group of companies and low material productivity ratio.

3. As pointed out earlier the indices are the true indicators of the progress made during the period. For material productivity the highest average index (117.70) was recorded for Grasim Ind. Ltd. This means the grasim industries substantially improved its material productivity during the period over the index of base year 100. On the other hand, Shree Digvijay Ltd., Texmaco, and Orient Paper Ltd. showed the index more than the 100 and also more than the group' s average. Kesoram Ltd. (90.10), Century Textiles Ltd.(97.30), Indian Rayon & Ind. Ltd.(72.90), Hindustan Motor Ltd.(94.29), Hindalco Ltd.(96.98), Birla V.X.L(95.484), Birla Power & Solutions Ltd.(89.09) and Zuari Ltd(89.288) performed below the combined average (98.065). It is a matter of great three Birla Group of Companies under study that the comparative performance of Indian Rayon Ltd., Birla Power & Solutions Ltd. and Zuari Ltd in this regard had been very low. It is suggested that the all three companies should take necessary steps to improve their material productivity by aggressive and economical material management.

LABOUR PRODUCTIVITY:

Labour productivity is considered to be the most important factor in productivity accounting. Labour productivity is calculated by convert input and output to the monetary terms. The ratio between the output and input expressed in terms of money output per rupee of input is the measure of labour productivity. Output per rupee of input shows the efficiency in utilizing the manpower resources input in the production.labour productivity and capacity utilization could be general indices, which are easily understandable and could

be the basis for measurement by mass of the employee. Apparently there is some substance in the contention that labour productivity may be regarded as one of the basic indicators of economic development. It is rightly considered to be one of the major determinants of national income.

1. On the basis of labour productivity analysis It is found that the average of labour productivity ratio was the highest among the selected units in Zuari Ind. Ltd.(27.54)followed by Mysore Cement Ltd.,(15.99) Hindalcon industries Ltd.,(15.88), Grasim Indusries Ltd.,(14.27), Indian Rayon & Ind. Ltd.,(11.93), Kesoram Ltd.(10.54), Shree Digvijay Ltd.,(9.715), Orient Paper Ltd.(9.356), Birla Power & Solutions Ltd. (9.197), Century Textiles Ltd., (8.315), Birla Corporation Ltd., (8.189), Birla V.X.L. Ltd., (7.455), Hindustan Motor Ltd.,(7.438) and Hyderbad Cement Ltd., (6.452).

2. While other units such as Jay Shree Tea & Ind. Ltd., and Texmaco Ltd. have very low labour productivity ratio. So these companies have not been utilizing its manpower efficiency.

OVERHEAD PRODUCTIVITY:

Accounting for overhead costs should be done in such a manner that would help management in controlling cost and decision-making. Thus efficiency in overhead is one of the basic objectives of accounting for overheads. It should be noted that net sales divided by total overhead input gives overhead productivity ratio indices, input-output ratio etc. For the Birla Group of Companies in India for the six-year period covered under this study. In the Birla Group overhead productivity the ratio was 2.432 while the average index of the Birla Group of Companies was 101.131, which was more than the base year index100. The overhead input required per rupee of output was 0.475 and the chi-square value was 7.244, which was less than the table value supporting the null hypothesis. The co-efficient was 9.695. However the Birla Group of Companies was efficient in utilizing the overheads.

1. It can be concluded that the overhead productivity ratio on an average in Texmaco Ltd. was found the highest of (5.243), then after it was (3.581) in Zuari Industries Ltd., (3.395) in Hyderabad Cement Ltd. (3.136) in Jay Shree tea & Ind. Ltd.,(2.733) in Birla power & solution Ltd.,(2.62) In Indian Rayon & Industries Ltd.,and(2.357) Hindalco Ltd., Ltd.All these units have been efficient in utilizing the overheads in production. While other units like Birla V.X.L. Ltd., Hindustan Motor Ltd., Grasim Industries Ltd., Century Textiles Ltd., Kesoram Industries Ltd., Orient Paper Ltd., Mysore cement Ltd., Birla Corporation Ltd. and Shree Digvijay Cement Ltd., have the on average overhead productivity ratio was very low. So these companies should try to be efficiency in utilizing the overhead in production.

OVER-ALL PRODUCTIVITY:

Overall productivity ratio measures the total productivity of the combined resources input used by an enterprise. In order to resolve the problem of calculation of the overall productivity ratio the data needed are: output (net sales) and total input Total input includes the elements of costs such as material, manpower and overhead. Total input calculated with the base year 1997-98 prices to indicate the change in productivity efficiency over the base year.

1. The average of overall productivity in the Birla Group was 0.9471. The overall productivity average index was 97.883. The Hindalco Ltd. was the best in utilizing the overall productivity resources followed by Indian Rayon Ltd., Grasim Ind. Ltd., Zuari Ltd., Jay Shree Tea & Ind., Hyderabad Cement Ltd., Birla Power & Solution, Birla V.X.L. Texmaco Ltd. and Century Textiles Ltd. All these units had the overall productivity ratio above the Combined Birla Group' s average ratio.

2. The overall productivity was the highest in Hindalco Ltd.(1.367) and it was found very lowest in Kesoram Industries Ltd.(0.215), Thus Birla Group of Companies except Orient Paper Ltd., Shree Digvijay Cement Ltd., Birla Corporation Ltd., Century Textile Ltd., and Texmaco Ltd. was not utilizing

the its overall productivity. In this connection it may be suggested that in order to increase productive efficiency, the cost reduction programme currently in operation should be intensified. It should be ensured that the level of efficiency once achieved does not go out of hand. There should be continuous measurement of efficiency for each and every aspect. The productivity data should be supplied in periodic reports with standard, actual and variance together with causes responsible for such variance.

CHAPTER-6: ANALYSIS FINACIAL EFFICIENCY:

The present study has been made in order to analysis the efficiency through the profitability ratio of the Birla Group of Companies in India and also of the individual Birla Group of Companies.

The profitability ratios which have been discussed in this chapter are: (1) Gross Profit Ratio (2) Operating Profit Ratio (3) Net Profit Ratio (4) Return on Gross Capital Employed (5) Return on Net Capital Employed (6) Return on Net Worth (7) A study of Earning Per Equity Share of the company under study has been also made.

1. The gross profit ratio of Birla Group of Companies showed declined trend with an average of 19.55 percent. The ratio varied from 16.49 percent in 2002-03 to 21.16 percent in 1997-98. The gross profit ratio was good and satisfactory

2. It is observed that the Hindalco Ind. Ltd. has the highest gross profit ratio followed by Birla Power & Solution Ltd., Kesorama Ind. Ltd., Century Textiles Ltd., Birla Corporation Ltd., Orient Paper Ltd. and Hydrabad Cement Ltd. These companies have the average ratio more than the Birla Group of Companies. The Indian Rayon & Ind., Mysore Cement Ltd., Hindustan Motor Ltd. and The Zuari Ind. Ltd. all these companies have the average ratio below the combined average ratio of Birla Group of Companies. The calculated value of kruskal Wallis one-way analysis is more than the critical value. So it

is concluded that there has been significant difference between operating ratio of the regions.

3. The operating ratio of Birla Group of Companies, which showed fluctuated trend during the study period. The average ratio 101.63 percent which was not satisfactory. The ratio varied from 96.77 percent in 1997-98 to 103.48 percent in 1999-2000. The ratio was not good except in 1997-98 the trend in Birla Group increased up to 1999-2000 then after it was remained constant. However it was more than the standard. In general manufacturing concerns, the operating ratio was expected to touch a percentage of 75 to 85 percent.

4. The operating ratio was the highest in Mysore Cement Ltd. Among all the companies and the lowest ratio seen in the Hindalco Ltd. A higher operating ratio is unfavourable for the company. Further it can be said that Hindalco Ltd. has achieved good remarks in the case of operating ratio.

5. The calculated value of H works out at 62.890, which is more than the critical value of 24.996. Hence, the rejection of the null hypothesis based on Kruskal Wallis' s analysis of variance test. The rejection of null hypothesis would indicate that there is significance different among the operating ratio of Birla Group of Companies.

6. The net profit ratio s widely used as measure of overall profitability and is very use fuel to the proprietors. Read along with the operating ratio, it gives the idea of the efficiency as well as of profitability of the business to a limited extend.

7. The net profit ratio in the Birla Group in India had shown a decreasing trend during the whole of the study period except in 1997-98.The averages was –1.68 percent and net profit ratio was not satisfactory.

8. The net profit ratio was the highest in Hindalco Ltd. among all the companies under study followed by Grasim Ind. Ltd, Birla Power & Solution Ltd. Jay Shree Tea & Ind. Ltd., India Rayon Ltd., and other selected units of Birla Group of Companies. As compared to Birla Group' s of Companies, the

performance of Hindalco Ltd. was better. While the performance of Grasim Ltd, Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd., Kesoram Mills Ltd. and Indian Rayon Ltd. was lower and the other selected units had shown the poor performance.

9. In order to improve the net profit ratio of the individual companies and the Birla Group as a while it has been suggested that Hyderabad Cement Ltd., Mysore Cement Ltd., Shree Digvijay Cement Ltd., Hindustan Motors Ltd., Birla V.X.L. Zuari Ltd. and Orient Paper Ltd. should try to reduce the cost of goods sold while Shree Digvijay Cement Ltd. should take steps to control the operating expenses.

10. Value of H work out at 19.70, which is less than the critical value of 24.996. Hence the acceptance of the null hypothesis based on kruskal Wallis analysis of variance. The acceptance of null hypothesis would indicate that all Companies of Birla Group' s net profit ratio might be considered equal.

11. The earning per share calculation made over years indicates whether or not the firm' s earning power on per share basis has changed over the period. The more the earning per share, the better are the performance and prospects of the company.

12. In the Birla Group' s Earning Per Share showed a fluctuating trend throughout the study period. However in 1997-98 it was the highest EPS In 1998-99 The EPS was negative and very low.

13. On the whole Hindalco Ltd. had the highest earning per share on an average in a span of six years followed by Grasim Ind. Ltd., Jay Sshree Tea & Ind. Ltd., Indian Rayon Ltd., Zuari Ltd., Kesoram Ltd., Century Textiles Ltd., Texmaco Ltd., Birla Power & Solutions Ltd. and other selected companies..

14. In order to improve the earning per share it has been suggested that Shree Digvijay Cement Ltd. Mysore Cement Ltd., Hyderabad Cement Ltd., Birla Corporation Ltd, Hindustan Motors Ltd., and Birla V.X.L. should try to reduce the cost of goods sold and operating expenses, try to get more profit after taxes and preference dividend.

15. Calculated value of H has been more than the critical value. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Rejection of the null hypothesis and the acceptance of alternative hypothesis reveal that there has been significance different between the earning per share of Birla group of companies. It may also lead to the conclusion that the earning per share differs from plant to plant.

16. Return on gross capital employed is the best test of overall profitability and efficiency of the business firm. Accompany with high rate of return on capital employed would be in a position to capitalize; i.g.it can take advantage of all favourable market opportunities.

17. The study shows that return on the capital employed in the Birla Group of companies in India has marked decreased trend during the whole year of the study period. The average was 5.82 percent. In the group this ratio was not satisfactory.

18. The analysis of the return on gross capital employed in individual Birla Group of Companies of the study period reveals that it was the in Hindalco Ltd. followed by Grasim Ltd., Indian Rayon Ltd., Birla Power & Solution Ltd., Kesoram Ltd., Jay Shree Tea & Ind. Ltd., Century Textiles Ltd., Zuari Ltd., Orient Paper Ltd. Mysore Cement Ltd. and Shree Digvijay Cement Ltd. Return on Gross Capital Employed Ratio of the company was not satisfactory, during the study period.

19. As compared to the Birla Group the performance of Hindalco Ltd., Grasim Ltd., Kesoram Ltd., Indian Rayon Ltd., Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd. and Century Textiles Ltd. was better while the performance of Zuari Ltd., Orient Paper Ltd., and Hindustan Motor Ltd. was lower. The rejection of the null hypothesis and acceptance of its alternative hypothesis would mean that there is significance difference between the Return on gross capital employed of Birla Group of Companies

20. Return on Net Capital Employed is the best test of overall profitability and efficiency of the business firm. A company with high rate of return on

capital employed would be in a position to capitalize; i.g.it can take advantage of all favourable market opportunities.

21. The study shows that returns on capital employed in the Birla Group of Companies in India had marked a fluctuated trend. The average was 7.11 percent in the Birla Group. This ratio was not satisfactory.

22. On the whole Hindalco Ltd. had the highest return on capital employed of 20.30 percent on an average in a span of six years followed by Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd., Kesoram Ltd. Grasim Ltd., Century Ltd. followed by other selected units.

23. As compared to the Birla Group' s, the performance of Hindalco Ltd., Birla Power & Solution Ltd., Kesoram Ltd., Grasim Ind. Ltd., Jay Shree Tea & Ind. Ltd., Indian Rayon Ltd., Century Textile Ltd. and Texmaco Ltd. were better. While the performance of Hyderabad Cement Ltd., Mysore Cement Ltd., Shree Digvijay Cement Ltd., Hindustan Motor Ltd. and Zuari Ltd. was lower.

24. The calculated value of H works out at 44.30, being more than the critical value of 24.996. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. It may also lead to the conclusion that the return on net capital employed differs from plant to plant.

25. In the light of the above discussion it is suggested that Mysore Cement Ltd., Shree Digvijay Cement Ltd., and Birla VXL Ltd. should undertake cost control measure so that increase net profit before interest and taxes of the company might enhance the return on net capital employed.

26. Return on net worth indicates how well the company has used the resources of the owners. On making an analysis of the performance of the Birla Group, the return had been on average (-) Rs.6.39. It showed decreased trend during the whole years of study period. The return on net worth in the covered period ranged between minus 239.37 (Orient Paper Ltd.) and Rs.19.48 (Birla Power & Solutions Ltd.). In the Birla Group of companies under study Hyderabad Cement Ltd., Mysore Cement Ltd., Shree Digvijay

Cement Ltd., Birla Corporation Ltd., Century Textile Ltd., Hindustan Motor Ltd., Birla VXL Ltd., Texmaco Ltd., and Texmaco Ltd. had to make a struggle for achieving the standard. Other companies under study had however, come up to the standard. The calculated value of H is more than the critical value. Therefore, the null hypothesis based on Kruskal Wallis one-way analysis test at 5 percent level of significant is rejected. The rejection of null hypothesis would mean that there is significant different between the Return on net- worth of Birla Group of Companies.

27. On the whole Hindalco Ltd. had the highest return on net worth of 16.42 Rs.on an average in span of six years followed by Grasim Ltd., Birla Corporation Ltd., Jay Shree Tea & Ind. Ltd., Birla Power & Solution Ltd., and Indian Rayon Ltd.

CHAPTER-7: ACTIVITY ANALYSIS

This chapter deals with the activity analysis in terms of size of investment. Activity ratios are concerned with how efficiency the assets of the firm are managed or utilized. These ratios indicate the rate at which different assets are turned over in the process of doing business. The greater the rate of turnover or conversion, is the more efficient the utilization or management, other things being equal, resulting in higher profitability. For the activity analysis following ratio are calculated (1) Total assets turnover ratio (2) Fixed assets turnover ratio (3) Current assets turnover ratio and (4) capital turnover ratio. It also highlights the efficiency with which the activities are concluded. The main conclusions drawn are as under:

1. The total assets turnover relation indication of financial soundness of the business in terms of the sales revenue generated against total funds employed in the business. This ratio also indicates the efficiency with which the assets of the company have been utilized. A high ratio suggests better utilization of the total assets of vice-versa.

2. It is observed that the total assets turnover ratio of Birla Group of companies. The ratio of Birla Group was fluctuating during the study period. The average ratio was 0.841 times. The ratio was varied from 0.805 times in 1999-2000 and 0.905 times in 1997-98.

3. The study found that Birla Corporation Ltd. has the highest turnover ratio followed by Hindustan Motor Ltd., Shree Digvijay Cement Ltd., Hyderabad Cement Ltd., Zuari Ltd., Kesoram Mills Ltd. and Orient Paper Ltd. All these companies have the average ratio more than the group average. While other companies such as Texmaco Ltd., Jay Shree Tea & Ind. Ltd., Century Textiles & Ind. Ltd., Grasim Ind. Ltd., Birla Power & Solution Ltd., Hindalco Ltd., Indian Rayon & Ind. Ltd. and Birla V.X.L had the average ratio below the Birla Group of Companies

4. The net sales to fixed assets ratio measures the efficiency with which a firm is utilizing its investment in fixed assets such as land, buildings, plant and machinery, furniture etc.

5. Fixed assets turnover ratio of Birla Group of Companies was showing fluctuating trend during the study period with an average of 2.331. The ratio ranged 2.025 times in 2000-01 and 3.049 times in 1997-98.

6. The study revealed that the Texmaco Ltd. had the highest fixed assets turnover ratio of 4.371 followed by Birla Power & Solution Ltd., Zuari Agro Ltd., Hindustan Motor Ltd., Shree Digvijay Cement Ltd., and Birla Corporation Ltd., The above mentioned companies had the highest average ratio the Birla Group of Companies. The following companies had the lower fixed assets ratio than the Birla Group' s average such as Orient Paper Ltd., Kesoram Mills Ltd., Mysore Cement Ltd. Hindalco Ltd., Grasim Ind. Ltd., Indian Rayon & Ind. Ltd., Birla V.X.L. Ltd., and Century Textiles Ltd. These companies should try to utilize the fixed assets with full capacity.

7. The current assets turnover ratio is indicative of the over-all marking efficiency of the organization. The ratio also shows the unnecessary locking up of capital in inventories and funds tied up in unrealized sundry debts.

8. Current assets turnover ratio of Birla Group of Companies showed increased trend after first years of the study period. The ratio was 2.024 times in 1997-98 and then it declined to 1.956 times in 1998-999. The ratio after these years went up to 1.997 times in 1999-2000. The ratio further reached at 2.12 times in 2000-01 and 2.166 times in 2001-02. It also showed increased trend in the last years of the study period. The ratio showed constant increased trend after first years of the study period due to increased in sales.

9. On the basis of analysis it is found that the utilization of current assets on the basis of average ratio was better in Birla Corporation Ltd., followed by Mysore Cement Ltd., Grasim Ind. Ltd., Shree Digvijay Cement Ltd., Century Textiles, Kesoram Mills Ltd., Indian Rayon & Ind. Ltd., Hindustan Motor Ltd., Zuari Ind. Ltd. and Orient Paper Ltd. Moreover all these companies had on an average ratio had been more than the Birla Group of Companies. While other companies had the on average ratio was below the combined group average. Hyderabad Cement Ltd., Hindalco Ind. Ltd., Texmaco Ltd., Birla V.X.L Ltd., Jay Shree Tea & Ind. Ltd., and Birla Power & Solution Ltd.

10. Capital turnover ratio explains the relationship between net sales to capital employed. This ratio refers over all profitability of a firm and also refers efficiency of management.

11. The capital turnover ratio of Birla Group of Companies. The capital turnover ratio showed increased trend during the study period. The capital turnover ratio ranged between 1.226 times in 1998-99 and 1.494 times in 2002-03 with an average of 1.379 times. The Birla Group of Companies was utilizing the its capital employed efficiently in the business.

12. Shree Digvijay Cement Ltd. showed the highest turnover ratio followed by Birla Corporation Ltd., Hindustan Motors Ltd., Texmaco Ltd., Hyderabad Cement Ltd., Zuari Ltd., Kesoram Ltd., Century Textiles Ltd., Mysore Cement Ltd., Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd., Orient Paper Ltd., Indian Rayon & Industries Ltd., Birla V.X.L Ltd., Hindalco Ltd., and Grasim Ind. Ltd.

CHPATER-8: FINANCIAL STRUCTUREE ANALYSIS:

Understandably a Financial analyst should not be interested in the performance of a business enterprise during a short-period of times because a company which is financially sound today may eventually lose its strength in the long period if it suffers prolonged losses.

1. On an average the Birla Group held a long-term debt equity ratio of 2.868 times. It implies that for every rupees of long-term debt 2.868 rupees of net worth are available to meet them. In other words it is found that the long-tern debt is more than two times of net worth. It was 1.025 times in 1997-98 then after it showed increased trend up to 2001-02. In the last year of study period it was very high. The Birla group showed very high debt is used in comparison to net worth in the financial structure. It was risky for the debtors.

2. On the basis of above information it is found that the long–term debt equity ratio has the highest 20.19 times followed by Birla V.X.L Ltd., Mysore Cement Ltd., Hindustan Motors Ltd. Century Textiles Ltd., Kesoram Mills Ltd and other selected units of Birla Group of Companies.

3. The total debt equity ratio of Birla Group of Companies showed increased trend during the study period. The average ratio was 4.107 times which means that for every 4 rupees of outside liabilities, the firm has one rupees of owner's capital. Therefore no margin of safety available for creditors.

4. Analysis expressed that the total debt equity was highest in Orient Paper Ltd., Mysore Cement Ltd. and Birla V.X.L Ltd. because of shortage of long term funds, so these units relies on short- term funds but it indicated poor long term strength of companies. The ratio in Hindalco Ltd. was the lowest among all units indicated sound financial management. The other units had the total debt equity ratio lower the Birla Group of Companies.

5. The total debt equity ratio of Birla Group of Companies. The ratio showed increased trend during the study period. The average ratio was 4.107 times which means that for every 4 rupees of outside liabilities, the firm has

one rupees of owner's capital. Therefore no margin of safety available for creditors.

6. The total debt equity ratio in selected Birla Group of Companies taken as a whole revealed increased trend such as in Zuari Ltd. Jay Shree Tea & Ind. Ltd., Birla V.X.L. Indian Rayon & Industries Ltd., Hindustan Motor Ltd. Hindalco Ltd., Hyderabad Cement Ltd., Mysore Cement Ltd towards mixes and towards mixes Kesoram Ind. Ltd. towards mixes fluctuation trend was found Birla Corporation Ltd. The total debt equity was highest in Orient Paper Ltd. followed by Mysore Cement Ltd. and Birla V.X.L Ltd. The other units had the total debt equity ratio lower the Birla Group of Companies.

7. The Interest Coverage Ratio, which measures the interest paying capacity of the company. It was found that Shree Digvijay Cement Ltd., Birla Corporation Ltd., Birla V.X.L, Zuari Ind. Ltd. and Orient Paper Industry Ltd. was not in a position to pay-off its interest obligations. So these companies should try to increase interest coverage ratio by reducing debt burden issuing equity share capital. The ratio of Hindalco Ltd. was highest indicated a sufficient fund available to pay-off interest. The average ratio of Birla Group of Companies was bettered as compared to other units.

8. The fixed assets capital employed ratio of Birla Group of Companies. The fixed assets capital employed ratio showed increased trend. The ratio ranged between 0.632 times in 1997-98 to 0.856 times in 2002-03. The average ratio was 0.749 times it means that the company has invested less than one rupees of capital employed in fixed assets. If a firm invests the capital employed in fixed assets, firm can earn high rate of return on capital employed.

9. It was found that the fixed assets ratio was good and more than the Birla Group of Companies of Shree Digvijay Cement Ltd., Jay Shree Tea & Ind. Ltd., Century Textiles Ltd., Mysore Cement Ltd., Hindustan Motors Ltd., Zuari Ind. Ltd. and Birla Corporation Ltd. Thus all the companies except

shree Digvijay Cement Ltd. indicated a sufficient security available for long-term creditors.

10. The capital gearing ratio for selected Birla Group of Companies taken as whole recorded a fluctuating trend with the range of 1.268 times in 1997-98 to 6.608 times in 2002-03. The combined average was 3.338 times.

11. It is found high-geared capital structure in. Hyderabad Cement Ltd., Orient Paper Ltd., Birla VXL Ltd., Hindustan Motor Ltd., Century Textiles Ltd, Birla Corporation Ltd., and Mysore Cement Ltd., and other units like Shree Digvijay Cement Ltd., Kesoram Textiles Mills Ltd., Indian Rayon Ltd., Hindalco Ltd., Texmaco Ltd., Birla Power & Solution Ltd., Grasim Industries Ltd., Zuari Ltd., Jay Shree Tea & Ind. Ltd., of the Birla Group of had the very lower geared capital structure.

12. The analysis of proprietary ratio indicated that as a whole the performance of Birla Group of Companies was not satisfactory because of all the companies' ratio was less than 50 percent except Hindlaco Ltd., Indian Rayon & Ind. Ltd., Birla Power & Solution Ltd., Jay Shree Tea & Ind. Ltd. and Grasim Ind. Ltd. The ratio indicated that in all the companies owner' s funds was not sufficient to acquire total assets. It means all companies relied more on outsider funds. The negetive ratio of Shree Digvijay Cement Ltd. indicated lack of owner' s fund. This indicated worst situation.

13. Fixed assets to Net-worth ratio have been calculated for ascertaining the percentage of fixed assets financing by owners of the company. The ratio showed fluctuated trend through out the study period. The ratio was ranged between 1.504 times in 2002-03 and 2.562 times in 1998-99 with an average of 1.811 times. The ratio was above the standard norm of 65 percent, which means that the fixed assets were more than the net worth.

14. The net fixed assets to net-worth ratio of Hindalco Ltd., Texmaco Ltd., and Jay Shree Tea & Ind. Ltd. was very good because it was near the yardsticks. The lesser the ratio the greater the margin of safety for long term creditors.

SUGGESTIONS:

The company should try to increase the production so as to get economies of large-scale production. It will assist in raising the rate of return on capital employed.

1. In order to increase the profitability of the companies, it is suggested to control the cost of goods sold and operating expenses.
2. The management should try to adopt cost reduction techniques in their companies to get over this critical situation.
3. The quantum of sales generated should be improved impressively in order better capital turnover ratio and to enjoy higher returns on investments.
4. The Birla Group of Companies is the capital intensive in nature but the policy of purchase of fixed assets should be carefully planned and reviewed so that the funds may be properly utilized.
5. To reduce power cost cement companies could establish a wind power project.
6. The Birla Group of Companies should replace their old plants and machinery to increase production. Modern plants may make the replacement in phased manner.
7. The companies should try to match the amount of working with the sales trends. Where there is a deficit of working capital, they should try to build on adequate amount of working capital. Where, there is an excessive working capital, it should be invested either in trade securities or should be used to replay borrowings
8. The management should try to utilize their production capacity fully in order to reduce factory overheads and to utilize their fixed assets properly.
9. The burden of interest has produced a deteriorating effect and reduced the percentage of net profit. It is suggested that the companies should

try to reduce the interest burden gradually by increasing the owner' s fund.

10. The few companies, which did not follow a definite policy of financing fixed assets, should follow such policy.
11. To strengthen the liquidity position, long-term funds have to be used to finance core current assets and a part of temporary current assets. It is better if the companies can reduce the over sized short- term loans and advances eliminates the risk arranging finance regularly.
12. The policy of borrowed financing in Birla Group' s selected units under study was not proper. So the companies should use widely the borrowed funds and should try to reduce the fixed charges burden gradually by decreasing borrowed funds and by enhancing the owner' s fund. For this purpose companies should enlarge their equity share capital by issuing new equity shares.
13. For regular supply of raw materials and the final product infrastructure facilities are required further improvement.
14. Cost accounting and cost audit should be made mandatory for this units and cost sheet along with annual financing statement should be prepared.
15. Birla Group of Companies should try to increase their exports with well-developed countries such as Africa, America, U.S.A. Australia, China etc. Government should have control over the quality of different products produced by Birla Group of Companies.
16. It is suggested that Mysore Cement Ltd., Shree Digvijay Cement Ltd., and Birla VXL Ltd. should undertake cost control measure so that increase net profit before interest and taxes of the company might enhance the return on net capital employed.
17. In order to improve the earning per share it has been suggested that Shree Digvijay Cement Ltd. Mysore Cement Ltd., Hyderabad Cement Ltd., Birla Corporation Ltd, Hindustan Motor Ltd. and Birla V.X.L.

should try to reduce the cost of goods sold and operating expenses, try to get more profit after taxes and preference dividend.

18. In order to improve the net profit ratio of the individual companies and the Birla Group as a while it has been suggested that Hyderabad Cement Ltd., Mysore Cement Ltd. Shree Divijay Cement Ltd., Hindustan Motor Ltd., Birla V.X.L, .Zuari Ltd. and Orient Paper Ltd. should try to reduce the cost f goods sold while Shree Digvijay Cement Ltd. should take steps to control the operating expenses

19. It may be suggested that in order to increase productive efficiency, the cost reduction programme currently in operation should be intensified. It should be ensured that the level of efficiency once achieved does not go out of hand. There should be continuous measurement of efficiency for each and every aspect. The productivity data should be supplied in periodic reports with standard, actual and variance together with causes responsible for such variance

20. It can be suggested Birla V.X.L Ltd, Texmaco Ltd., Birla Power & Solution Ltd and Orient Paper Ltd. tightens its credit and collection policy.

21. These companies should try to manage a small amount of working capital, implying that a policy of over trading was being followed by the company. Hence the company is well advised to enhance its working capital funds.

22. The cost of goods sold was more than 90 percent and resulted in a low percentage of the operating profit. It is suggested that the Government should supply basic inputs required by the Birla Group of Companies. The government should also create such an environment that the units may get inventories to avoid the holding of inventories and to regulate their production.

23. The present restriction of compulsory packing of 50 to 60 percent of cement production in jute bags should be abolished as it more costly than other available substitute packing material.
24. Corporate tax should be abolished gradually to encourage the capital market for the cement companies.
25. The Government of India may reduce the excise duty rates application to the car-manufacturing units to enable the common man to purchase a car. This may boost up the sales of this sector. This object can also be achieved by fixing different rates of excise duties on different makes. The make which is less popular may be gives a subsidy which will help it to make more sales.
26. The margins of the domestic aluminium players are under pressure on account of fall in LME aluminium prices. With leading players like Hindalco and Nalco giving more emphasis on downstream production, their margins are likely to be partially protected, despite sharp fall in LME prices With Nalco and Hindalco among low cost producers in the World; the government should help in such situation.
27. In order to boost export and improved economic condition following strategies can be recommended (1) Quality improvement through different types of research and development programmes. (2) Cost reduction in every segment of operation. (3) Infrastructural development and improvement in service levels. Above all Indian Government should nourish it with proper care and attention to recover the tea industry to its former position, if possible.
28. On its part, the government needs to formulate appropriate a forestation policy that will not only increase greenery in the country, but will also make available quality raw material at lesser costs to the domestic paper industry.

29. Also suitable mechanism needs to be put in place to ensure that Newsprint imports are not diverted to other requirements, which has been harming the domestic paper units.

30. Cost control through higher indigenisation, better supply chain management and value engineering coupled with strong brands are the critical factors for success. Networking with car finance providers and a large after sales service network is also essential.

31. The Government should review the automotive tariff structure periodically to encourage demand, promote the growth of the industry and prevent India from becoming a dumping ground for international rejects.

32. In respect of items with bound rates viz. Buses, Trucks, Tractors, CBUs and Auto components, Government should give adequate accommodation to indigenous industry to attain global standards.

33. In consonance with Auto Policy objectives, in respect of unbound items i.e., Motor Cars, MUVs, Motorcycles, Mopeds, Scooters and Auto Rickshaws, the import tariff shall be so designed as to give maximum fillip to manufacturing in the country without extending undue protection to domestic industry.

SELECTED BIBLIOGRAPHY

- Ø ANTHONY RABERT R.P.: Management accounting text and cases, Richard D.Irwininc, Illinois, 1964
- Ø ROBERTN. ANTHONY: Management accounting, House wood Illinois: Richard & GlENN.AWEISCH D.Irwin, 1977
- Ø AGRAWAL M.D.: Efficiency Of Public Enterprise India (Jaipur: Prateekha Publication.1987), P.206
- Ø BACKERC.JOHN:Introduction to corporate Finance, McGraw Hill Book co. New MALATT D.V. York, 1936.
- Ø BRADLEYJ.F: Administrative Financial management, Branves and Noble, New York, 1967.
- Ø BATTY J.: Management accountancy, orient longmans, New Delhi, 1966
- Ø BOOT JOHN C.G. & COX EDWIN B.: Statistical analysis for managerial decisions, 2th edition,TataMcgrew Hill Publishing Co. New Delhi, 197
- Ø BRADLEY J.V: Distribution free statistical tests, Prentice Hall Inc. New Jersey, 1968
- Ø BRADLEY J.V: Distribution free statistical tests, Prentice Hall Inc. New Jersey, 1968
- Ø BATTY J.: Management accountancy, Macdonald and Evans ltd., London, 1975
- Ø BATTY J.: Management accountancy, Macdonald and Evans ltd., London, 1975
- Ø CHARLES W.GRESTERNBERG: "Financial Organization and management of Business" 4th Edition. Asian publication House, New Delhi, 1960

- CHYAL B.R.: Financial management of state enterprise well publisherJaipur, 1986.
- CHOWDHARY S.B.: Analysis of company financial statement. Asia publication House, 1964.
- FOULK A. ROY: Practical Financial statement analysis, Tata McGraw Hill ed.vi 1972.
- GUTHMANN H.G.: Analysis of Financial statement, Prentice Hall Inc. New Delhi, 1935.
- GULERIANR.C. Statistics for Decision-making, W.B.Saunders Company, Philadelphian, 1977.
- HUSBANDS AND DOCKERY. Modern corporation Finance, Richard D. Irwin Inc. Illinois, 1957.
- HELFERT A. ERICH:" Techniques of financial analysis" 6th,Universal Bolo Stall, New Delhi, 1989.
- JAMES C. VAN HORNE. : Financial Management and policy, prentice hall of India (p) Ltd. New Delhi, 1997.
- KHAN AND JAIN: Management accounting, tata McGraw Hills, New Delhi, 1987.
- KENNEDY R.D. & MCMULLER: Financial statements-Forms Analysis and interpretation Richard D.Irwin inc.illinois, 1985.
- KULSHRESTHRA R.S.: Profitability in India's steel industry during the decade 1960-70, a thesis submitted for the degree of Ph.D Deptt. Of E.A.F.M, university of Rajasthan. Jaipur, 1973.
- KOTHARI C.R.: Research Methodology –methods and techniques, Wishwa prakashan, in New Delhi, 1997.
- KHANDEL N. M.: Working capital management in small scale industries," Ashish Publishing House, Punjabi Baug, New Delhi, 1985

- LAWRENCE J.GITAMAN: principle of managerial finance" Harper and Row Publishers, New York, 1976
- MOHANTY R.P.:IN his article" Managing technology for strategic advantages" The economic times, (Thursday 9 the Jan. 1992)
- MICHAELV.P: Research Methodology in management. Himalayan Publication House, Bombay, 1958.
- MURTHY V.S.: Management finance, vakils Feller and Simons ltd., Bombay, 1978 & BLOCK AND HIRT: Foundations of Financial management, Richard D. Irwin inc, Homewood, illinois, 1978
- MAHESHWARI S.N.: Management accounting and financial controls, Sultan chand & sons, Delhi, 1994.
- MAYOR J.N.: Financial statement analysis, Prentice Hall of India (p) Ltd.New Delhi, 1972.
- NORMANE. &HANSON, EARN: Accounting and introduction, Harcourt B Jovanovich inc., New Delhi, 1973.
- PRASAD N.K.: Cost accounting, Calcutta: Book syndicate private ltd, 1979,
- PARK COLIN &JOHN E.GLADSON: Working capital, Macmillan Company, New York, 1963.
- PANDAY I.M.: Financial management, Vikas publishing House pvt. New Delhi.1994
- PHILIP E.FRESS & CARLS WAREN: Financial accounting, Southwestern Publishing Cincinnati, 1982
- PORWAl L.S. & KUMAR VINOD. : Financial statement analysis and Prediction of future of Return, A case study of engineering industry, Chartered accountant, 11th may 1980.
- PRASAD N.K: Cost accounting, Book syndicate pvt. Ltd.Calcutta, 1981.

- PANDEY I.M.: Financial management, vikas publishing House, New Delhi, 1991.
- RAJESHWAR K. RAO: Working capital planning and control in public enterprises in India. Ajanta Publication (India), Jawaharlal Nagar, Delhi-110007, 1985
- SRIVASTAVE J.P: Labour productivity, (new Delhi: oxford and I.H.B Publishing co.1982).
- STEWNSON W.J.: Business statistics, Harper and Row, New York, 1978.
- SINGH K.P & SINHA A.K.: Management of working capital In India, janki Prakashan, SINGH S.C.ashok Rajpath, Patana, 1986.
- SINAGAL AND BANSAL: Statistical methods for research workers, central publishers, Ludhiana, 1986.
- SINHA D.K.: Economics of industrialization in India–productivity industrialization and economic development" Deep and Deep Publications, New Delhi, 1988,
- VIJAYASARADHI S.P& RAJESHWAR K. RAO. : Working capital investment and financing in public enterprises, the management accountant, Calcutta, May 1998.
- WESTON AND BRIGHAN: Management finance, Holt, Rinehart, Winston, New York, 1969.
- WALKER E.W: Essential of Financial management" Eastern economy edit. Prentice Hall of India Pvt. Ltd, New Delhi, 1976

ARTICLES

- Agrawal N.P. & Gupta S.l. Indian cement industries problems and prospects, Indian journal of Marketing, September 1984.
- Dutta S.K. Indian Tea Industry an appraisal' , " The management accountant" Calcutta March 1992.
- Kar A.P.Need for cost and Management control in Indian Tea Industry' the management accountant: Calcutta December 1995.
- The journal of Indian Tea Association, Indian Tea Scenario, 2002,Kolkata.
- Mallick Amit and Debasish sur " Working capital and profitability: A case study in interrelation" November 1998.
- Nautiyal R.R and K.S Negi " Cotton textile industry: A case study of the public sector companies in utter pradesh"
- Sabajit Paul " An overview of the Indian Tea Industry" management accountant, june, 2004
- Swami N. Bonu " Risk and Return analysis " Case study of selected industries. April 1994.
- Tiwari R.S., Cost reduction in cement industry, the management accountant, Nov.1998.

PERIODICALS

- Annual reports of selected companies from 1997-98 to 2002-2003.
- Business India
- Bombay Stock exchange Official directory
- R.B.I.Bulleting
- Capital market
- Chartered accountant
- Chartered Financial analyst
- Commerce
- Cement review
- Financial express Mumbai and Delhi (India)
- Fact for you
- Indian Journal of commerce
- Indian journal of accounting
- Indian Journal of public enterprise
- Investment week
- Cement Manufacturer' s association publication
- Management accountant
- Manorama year book
- Research In third word accounting US.

DATA BASE

- CAPITAL LENE 2000
- CMIE PROWESS

WEBSITES

- WWW.INDIAINFOLONE.COM.
- WWW.CAPITAL MARKET. COM
- WWW.BISNET .COM
- WWW.INDIATEA.ORG.
- WWW.TEAUTION.COM
- WWW.VALUENOTES.BIZ/RESEARCH TEATOC.ASP
- WWW.ECONOMYWATCH .COM

NEWS PAPERS

- The Economic Times
- The Financial Express
- The Indian Express
- The Times of India